ICCIT 2015

PROGRAM BOOK

18TH INTERNATIONAL CONFERENCE ON COMPUTER AND INFORMATION TECHNOLOGY (ICCIT) 2015

December 21-23, 2015

Technical Co-Sponsor

IEEE

IEEE Bangladesh Section

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Department of Computer Science and Engineering
Military Institute of Science and Technology (MIST)
Mirpur Cantonment, Dhaka-1216

PROGRAM BOOK

18TH INTERNATIONAL CONFERENCE ON COMPUTER AND INFORMATION TECHNOLOGY (ICCIT) 2015

December 21-23, 2015

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بِسْمِ اللّٰہِ الرَّحْمٰنِ الرَّحِیم

PRESIDENT
People's Republic of Bangladesh



MESSAGE

I am indeed very happy to know that the Department of Computer Science and Engineering (CSE), Military Institute of Science and Technology (MIST) is organizing the 18th International Conference on Computer and Information Technology (ICCIT) 2015 at its green campus in Mirpur Cantonment, Dhaka on 21-23 December 2015. I appreciate the initiative of MIST and heartily welcome all the participants to the ICCIT 2015.

In this contemporary world of globalization, the demand of technological advancement is ever growing. Computer and information technology is playing a vital role in promoting knowledge and technology as well as achieving the desired growth and development. The acquisition of superior technology and scientific knowledge provides the advantageous leverage to meet the challenges in every sphere of day to day life.

I firmly believe that this timely arranged conference will focus on the facets of technological development as well as their demerits and remedies. I hope that this conference would pave the way for creating ample opportunities to the researchers, academia, professionals and policymakers to explore the latest development in the fields of ICT, and enable them to contribute meaningfully to achieve the cherished goal of Digital Bangladesh.

I wish the ICCIT 2015 a grand success.

Khoda Hafez, May Bangladesh Live Forever.

Md. Abdul Hamid

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِيم



MESSAGE

PRIME MINISTER
Government of the People's
Republic of Bangladesh

I am happy to learn that the Department of Computer Science and Engineering (CSE), Military Institute of Science and Technology (MIST) is hosting the 18th International Conference on Computer and Information Technology (ICCIT 2015) in Dhaka on 21- 23 December 2015.

The widespread applications of computer and information technology can immensely benefit our country both socially and economically. My government has attached top priority to education, research and adoption of latest technology to bring about socio-economic reforms in the country.

Taking the advantage of information technology, we have relentlessly been working to transform the lives of the rural people of Bangladesh with a view to providing them a bright future.

It is expected that this conference will provide the desired platform for exchanging innovative ideas and knowledge among the participants from home and abroad that will be helpful in building a digital Bangladesh.

I hope that ICCIT 2015 will promote collaborations among researchers in the fields of computer and information technology in Bangladesh and beyond.

I wish all out success of ICCIT-2015.

Joi Bangla, Joi Bangabandhu
May Bangladesh Live Forever

Sheikh Hasina

بِسْمِ اللّٰہِ الرَّحْمٰنِ الرَّحِیم



MESSAGE

MINISTER
Ministry of Education
Government of the People's
Republic of Bangladesh

I am delighted to learn that the three-day long 18th International Conference on Computer and Information Technology (ICCIT) 2015 begins on the campus of Military Institute of Science and Technology (MIST) on the 21 December.

The ICCIT produces positive results in terms of sharing scientific, technical and engineering ideas around the globe. It is a great privilege for our young researchers and academicians to present their research works before such an august gathering. This conference would hopefully be a genuine forum for cooperation and collaboration among the participants.

I am sure that such an auspicious event will open up a new arena for building the Digital Bangladesh as envisaged by the Hon'able Prime Minister Sheikh Hasina.

I congratulate the Department of Computer Science and Engineering of MIST and IEEE Bangladesh Section for being the organizer and the technical co-Sponsor of the event of sharing scientific knowledge, views and experiences of the professionals from all over the world.

I wish ICCIT-2015 a grand success.

Nurul Islam Nahid, MP



بِسْمِ اللّٰہِ الرّحْمٰنِ الرِّحیم

MESSAGE

STATE MINISTER
ICT Division
Ministry of Posts,
Telecommunications and Information Technology
Government of the People's Republic of Bangladesh

ICT DIVISION

It is a great pleasure for me to know that Military Institute of Science and Technology (MIST) is hosting the most prestigious 18th International Conference on Computer and Information Technology (ICCIT) 2015 during 21-23 December 2015 at its lush green serene campus in the Mirpur Cantonment, Dhaka, Bangladesh.

An international conference of such type is truly a meeting place for the scientists, scholars, industry people and researchers. It plays a very important role in exploring the developments progress in field of ICT globally. Besides, it is encouraging and supporting students and teachers for scientific investigations and research, and as a whole, driving forward the society into an era of digital touch. People from industries, beside the academics, get an opportunity to come across the innovations in engineering, science and technology. ICT has a special significance in this context. I am sure that such an auspicious event will certainly pave a long way for building the Digital Bangladesh as envisaged by the Honorable Prime Minister Sheikh Hasina.

I have come to know that this series of conferences is the product of great enthusiasm of the people, living here in Bangladesh and abroad, who have strong feeling and commitments towards the country and the countrymen. I am also informed of the momentum gained by the series of ICCITs held in Bangladesh. I hope this conference will be able to play its due role in taking Bangladesh to the heights of human achievements worldwide in the field of ICT.

I wish all the success of ICCIT-2015.

17.11.2015.

Zunaid Ahmed Palak, MP

بِسْمِ اللّٰہِ الرَّحْمٰنِ الرَّحِیم



CHIEF OF ARMY STAFF

CHIEF OF ARMY STAFF
Bangladesh Army

MESSAGE

I am happy to know that Department of Computer Science and Engineering(CSE), Military Institute of Science and Technology (MIST) is hosting the 18th International Conference on Computer and Information Technology (ICCIT) - 2015 during 21-23 December 2015. I heartily appreciate the initiative and welcome all the participants to the conference.

In this contemporary world of globalization, the demand of technological advancement is ever growing. The acquisition of superior technology and scientific knowledge provides upper hand to face the challenges of modern battlefield. Collection of information, analysis, communication, and display capabilities have modified the way we think, act, and organize, whether in industry, education, or in the military. Information Technology has completely changed the battlefield scenario and concept of security. The side possessing precise information and can use it effectively has a major advantage over its opponent.

In order to achieve interoperability with friendly armed forces in joint operations scenario, our defence forces need to modernize and create force structures that are capable of undertaking network-centric warfare on land, at sea, and in the air. In the light of Bangladesh embarking upon a digital journey, efforts must therefore be made to optimally exploit the available expertise to develop an appropriate C4I2SR capability for the defence forces. I urge all the defence officers present here, to actively participate in the conference and take this opportunity to share their tactical and operational perspectives with the industry and academia in the context of the modernization of our armed forces.

I hope, ICCIT-2015 will act as a catalyst for the modernization of Bangladesh Army as well as digitalizing Bangladesh. This will also help our researchers to update themselves on recent innovations and ideas from the icons around the globe.

I wish all out success of ICCIT-2015.

General Abu Belal Muhammad Shafiul Huq, ndc, psc

بِسْمِ اللّٰہِ الرَّحْمَنِ الرَّحِیم

CHIEF OF NAVAL STAFF
Bangladesh Navy



MESSAGE

It gives me immense pleasure to know that Military Institute of Science and Technology (MIST), Mirpur Cantonment, Dhaka, Bangladesh is organizing the 18th International Conference on Computer and Information Technology (ICCIT) 2015 during 21-23 December 2015 with Institute of Electrical and Electronics Engineering (IEEE) Bangladesh as the technical co-sponsor. On this auspicious occasion, I would like to extend my heartiest congratulations to the organizer for their efforts in holding this unique conference.

It is not the machine, but the man behind it that matters. Hence, the education, training, and research in the field of engineering, science and technology are inevitable necessities for transforming Bangladesh into a digital and middle income country by the year 2021 as envisaged by our Hon'ble Prime Minister Sheikh Hasina . I am happy to know that MIST is among one of the key role players in attaining that goal. Information and Communication Technology (ICT) will act as a catalyst to achieve these objectives. An international conference of such type should provide an excellent opportunity for all participants, students, faculties and researchers to explore the latest technological advancements and innovations in the field of ICT.

It is gratifying to note that the number of participants in this conference from home and aboard is quite large. And I believe, being committed to ensuring excellence in ICT education in Bangladesh, MIST, through this kind of conference will enhance technological knowledge and skills of the participants as per global standard.

I wish ICCIT 2015 a grand success.

Vice Admiral Muhammad M Farid Habib, NBP, ndc, psc

بِسْمِ اللّٰہِ الرَّحْمٰنِ الرَّحِیم



MESSAGE

CHIEF OF AIR STAFF
Bangladesh Air Force

I am extremely delighted to know that the CSE Department of Military Institute of Science and Technology (MIST) is going to organize the 18th International Conference on Computer and Information Technology (ICCIT-2015). My heartfelt felicitation to the Chief Patron and all members of MIST for arranging such a time demanding international conference in MIST.

As one of the Vice Chairmen of the Council of MIST I take pride that MIST, premier technical institute of Bangladesh armed forces, is making a remarkable stride in enlightening and empowering our personnel to face the challenges in the field of science and technology. It is mentionable that the commencement of Aeronautical Engineering program, the first of its kind in Bangladesh, is time-befitting step taken by MIST towards technological advancement. This institute has marched a step further by extending its campus to BMA and BAFA for aeronautical, computer science and other engineering programs. All these academic developments and endeavor testify MIST's commitment to achieve the motto "Technology for Advancement".

Technology is key to sustainable development. Defense industry is strongly impacted by Information and Communication Technology (ICT), and there is a strong correlation between these two. ICT has transformed the industry from producing dumb bombs to smart weapons, from people-centric to network-centric battlefields management, from aftermath combat review to real-time combat surveillance, from land and sea to air and outer space superiority, and from hardware-based to software-based force multipliers. It is an established fact that future conflicts will be decided by 'Cyber Warfare'. I am confident that MIST would continue to develop ICT and take the country forward to attain Cyber Warfare capability.

The ICCIT-2015 would provide an effective forum for the academia, ICT professionals and industry representatives for exchanging their innovative ideas and sharing knowledge in the field of computer and ICT. I strongly believe that through this unique conference all participants will be immensely benefitted. I ardently wish a grand success of ICCIT-2015.

Air Marshal Abu Esrar, BBP, ndc, acsc

بِسْمِ اللّٰہِ الرَّحْمَنِ الرَّحِیم



MESSAGE

SECRETARY
Information and Communication
Technology Division

ICT DIVISION

I am happy to know that that Military Institute of Science and Technology (MIST) is hosting the 18th International Conference on Computer and Information Technology (ICCIT) 2015 to be held on 21-23 December, 2015 at its scenic green campus in Mirpur Cantonment, Dhaka, Bangladesh.

As we know that Information and Communication Technology (ICT) is the mother of civilizations, of arts and science. As part of implementation of Digital Bangladesh the government undertook numerous initiatives in the ICT sector since 2009. After implementation of significant number of initiatives, we saw changes in the livelihood of people. With the help of ICT, human beings entered into a new type of civilization, widely known as Digital age. Dissemination of information and delivery of service using ICT have not only been improving the livelihood of people, but also contributing to the economy and growth.

I truly believe that this prestigious international conference will become an important congregation of researchers and professionals from all over the world. This event will stimulate and enhance the research and knowledge based field significantly by presenting innovative ideas with diversified thinking.

I also expect that this conference will provide new and creative ideas that will help institutionalize the dream of Digital Bangladesh of the present government. I would like to extend my heartiest congratulation to MIST, organizers and to everyone involved in this event.

I wish grand success of the ICCIT 2015

Shyam Sunder Sikder



بِسْمِ اللّٰہِ الرّحْمَنِ الرِّحیم

MESSAGE

COMMANDANT
Military Institute of Science and Technology(MIST)

We heartily welcome all the distinguished participants to the 18th International Conference on Computer and Information Technology (ICCIT 2015) which is going to be organized by the Department of Computer Science and Engineering (CSE), Military Institute of Science and Technology (MIST) at our green and serene campus in the Mirpur Cantonment, Dhaka, Bangladesh during
21 - 23 December, 2015.

Computer and Information Technology play enormous role in promoting knowledge and technology, and it is essential for educators, researchers, industrial and commercial concerns in the present knowledge based society. With the theme "ICCIT for Innovation and Sustainable Development'', it is expected that the conference will provide opportunity to explore innovative ideas, approaches and techniques to solve real life problems. We strongly believe that the conference will provide suitable platform for exploring different aspects of ICT, and shall enable the ICT professionals, scientists, engineers, researchers, educators and students to meet and exchange ideas.

ICCIT-2015 would not have been possible without valuable contribution of the authors, keynote speakers, session chairs and respected members of the international program committee, advisory committee, and organizing committee. We truly appreciate their immense efforts in organizing such an important event. We are grateful to the keynote speakers for kindly accepting our invitation to share their expertise and inspiring us to meet the objectives of the conference. We are deeply appreciative of financial supports and corporation extended by ICT Division, Ministry of Post, Telecommunication and Information Technology; Sena Kaylan Sangstha; Trust Bank Limited; a number of reputed universities; scholars and Services Headquarters. Special mention goes to Robi Axiata Limited for the platinum sponsorship and to IEEE Bangladesh Section for being the technical co-sponsor of this conference.

To make this conference successful one, a dedicated group of faculty members along with administrative staff, officials and students have worked relentlessly under the directives of Head of CSE Department who very sincerely chaired the Organizing Committee.

I believe that all the participants will engage themselves to make ICCIT-2015 a very fruitful conference. I wish them a pleasant stay in Dhaka during the conference.

Major General Abdul Quadir

بِسْمِ اللّٰہِ الرَّحْمٰنِ الرَّحِیم

CHIEF PATRON
ICCIT-2015



MESSAGE

It is a matter of immense pleasure that the Department of Computer Science and Engineering, Military Institute of Science and Technology (MIST) is going to organize the 18th International Conference on Computer and Information Technology (ICCIT 2015) at MIST, Mirpur Cantonment, Dhaka, during 21 to 23 December 2015.

As I know the ICCIT produces excellent results in terms of opening avenues for information and knowledge sharing, updating with the current innovations in the ICT fields by the scientist, scholars, engineers, educators and technologists. Continuing the trend, I hope that the coming 18th conference being held at MIST will also act as knowledge sharing forum for the participants. The widespread applications of computer and information technologies are essential ingredients for sustainable development of our country. I am sure that such an auspicious event will certainly add an impetus to our efforts of making a digital Bangladesh.

The ICCIT 2015 would provide great opportunity for our scholars to present their research work to the rest of the world, thus creating an avenue to make effective cooperation and collaboration among the participants. It is a pleasure to know that quite a large number of participants from all over the world have responded to ICCIT 2015 in this year.

I congratulate the authors for their valuable research works. My sincere appreciation goes to all organizers and reviewers for their valuable time and effort with refinement and excellence to organize such an international conference.

I wish the conference a grand success.

Major General Md Siddiqur Rahman, SGP. hmc, psc
Engineer in Chief, Bangladesh ARMY

بِسْمِ اللّٰہِ الرَّحْمٰنِ الرَّحِیم



MESSAGE

CO-CHAIR
ICCIT-2015

On behalf of the 18th International Conference on Computers and Information Technology (ICCIT-2015), I would like to welcome and thank you for participating in this conference. The main purpose of ICCIT-2015 is to bring together researchers and practitioners from academia, industries and government research labs to share their expertise on the latest trends and advancements in various areas of computers, information and communication technology. This conference is sponsored by the Institute of Electrical and Electronic Engineers (IEEE) the largest professional society in the world.

This year we received a total of 348 papers submitted by 852 researchers from 22 countries. The 120 papers that were finally accepted for this conference are well balanced and report on the many ongoing efforts and recent research results in various areas of computers, communications and information technology. All papers submitted to ICCIT-2015 were blind reviewed by up to 3 reviewers involving 138 experienced professionals from 15 countries outside Bangladesh. Besides peer review, all ICCIT-2015 papers were also processed through the Turnltln plagiarism check software package before final acceptance decisions were made. The acceptance rate is nearly 32% which, to the best of our knowledge, is the lowest among all conferences held in Bangladesh, and it reflects the rigorous quality maintained in this conference. The accepted papers summarize the research work of researchers from 22 countries thus providing true international flavor to ICCIT-2015.

I would like to thank the authors for the contribution of their papers, the reviewers for their dedication and timely review, members of the International Program Committee for their guidance, members of the Research Integrity and Ethics Committee for their commitment, members of the organizing committee for coordinating all conference related activities, MIST administration for proving the facilities, and ICCIT 2015 staff for ensuring timely production of the ICCIT 2015 conference proceedings. I must profusely thank my co-worker at the University of South Alabama for efficiently coordinating the plagiarism check and paper review process and for spending countless hours of their personal time to address author queries. Special thanks are due to the Chief Guest, Panel Members, Keynote Speakers, and Invited/Technical Speakers for attending and enlightening ICCIT-2015. I would also like to thank IEEE Bangladesh Section for technical co-sponsorship of ICCIT-2015 and sponsoring a Best Paper Award. Finally, I am personally grateful to Prof. Muhammad Harunur Rashid, a Life Fellow of IEEE, for sponsoring the :Dr. Fatema Rashid Best Paper" awards.

I sincerely hope that you will take advantage of the various papers presented at this conference and explore collaborative research opportunities with fellow colleagues who are attending ICCIT-2015 from all over the globe.

Prof. Mohammad S. Alam, Fellow-IEEE, OSA, SPIE, IoP, IS&T, and IET

بِسْمِ اللّٰہِ الرَّحْمَنِ الرَّحِیم

ICCIT 2015

CHAIR
Advisory Committee
ICCIT-2015



MESSAGE

I take this opportunity to welcome and thank all the participants of 18th International Conference on Computer and Information Technology (ICCIT-2015) which is being held at Military Institute of Science & Technology (MIST) from 21st to 23rd December 2015. I humbly record my appreciation for the Bangladesh Section of Institute of Electrical and Electronic Engineers (IEEE) Bangladesh Section - the largest professional society in the world, for technical co-sponsorship of the conference. It hass been already 18 years we are organizing ICCIT without any break and with renewed interest!!!

The main purpose of ICCIT is to bring together researchers and practitioners from academia, industry and government research labs, to share their expertise on the latest trends and advancements in the field of computer, information and communication technology.

I am happy to see the overwhelming response to call for papers, and the large participation by distinguished participants from home and abroad in this year's conference. My thanks go to all authors for their contributions. It is expected that this conference will provide necessary platform and framework for exchange of ideas for future cooperation in research works, academic development and for facilitating creation of Digital Bangladesh as the Government have set a target for the nation.

As the Chair of the Advisory Committee, I have all the praise for the hard work members of the Advisory and Organizing Committees have put together to cross all the hurdles and make this conference a huge success. I am deeply indebted to the international programme committee members for their painstaking efforts for review of the submitted manuscripts in the stipulated period of time. I thank key note speakers, plenary speakers for their time, and for making us proud with their presence.

I sincerely hope that the participants will enjoy hospitality, and flawless and disciplined organization of this conference, exchange ideas among participating researchers and academicians, and explore collaborative research opportunities with various professionals and experts, attending the ICCIT-2015 from all over the globe.

I ardently wish a grand success of ICCIT-2015.

Prof. M Kaykobad
Dean, Faculty of EEE, BUET

بِسْمِ اللّٰہِ الرَّحْمَنِ الرَّحِیم



MESSAGE

CHAIR
IEEE Bangladesh Section

IEEE Bangladesh Section

It is my pleasure to inform you that IEEE Bangladesh Section (IEEE-BDS) provided Technical Co-sponsorship for the 18th International Conference on Computer and Information Technology (ICCIT-2015) to be organized by Military Institute of Science and Technology (MIST) at Dhaka.

IEEE is world's largest professional association and dedicated to advancing technological innovation and excellence for the benefits of humanity. From its inception in 1993, IEEE-BDS is working to promote engineering education and advanced research in Bangladesh. Currently it has around 1500 members, chapters of four technical societies (communication society (COMSOC), power and energy society (PES), electron device/solid state circuit society (EDS/SSCS)), Engineering in Medicine and Biology Society (EMBS), two affinity groups (women in engineering (WIE) and young professional (YP)), two student chapters (Industrial Application Society (IAS) and Microwave Theory and Techniques (MTT) society), two SIGHT groups (FLASH and CARG) and 21 student branches from 21 engineering universities. Petition for opening of IEEE Computer Society is at the final stage. IEEE-BDS and its societies, affinity groups, chapters, and student branches regularly organize technical seminars, workshops, congress, contests, Olympiads, short courses, industrial tours, project competitions, outreach programs, humanitarian activities, robotic challenges, award programs, industrial, educational and professional activities. Because of outstanding performance, our WIE Chair has own prestigious awards from region 10 and international WIE. This year some of our dedicated volunteers have been selected in different R10 committees, which is a great honor for us. IEEE BDS has won project funds from R10 in six different categories through very tough competitions. This year, volunteers from IEEE BDS have won prizes in IEEE R10 SYW Congress held in Sri Lanka. My best wishes to all award winners and project grant winners. Last year total number of members was about 1000 and in this year, it is now more than 1500. This year IEEE-BDS is awarded “2015 Outstanding Section Membership Recruitment Performance”. I hope participants in this conference will join in IEEE if not yet joined and actively participate in our upcoming events.

This year apart from ICCIT 2015, several international conferences, namely ICEEICT, ICAEE, EICT, ICCIE, NSYSS, and ICEEE are technically co-sponsored by IEEE-BDS and IEEE ICTP is sponsored by COMSOC BD Chapter. For the first time in history, IEEE-BDS is going to organize WIE technical conference IEEE WIECON-ECE 2015 in collaboration with WIE Affinity Group of IEEE-BDS. For the first time, IEEE-BDS has launched IEEE ProTalks 2015, a workshop focusing technical leadership, management and entrepreneurship. This year IEEE-BDS has successfully organized the IEEE Region 10 Meet 2015 where 110 foreign delegates from 17 countries including USA, Australia, Japan, India, and China participated. Since its inception, this is the first time IEEE BDS has got this opportunity.

It is expected from the organizer that, being an international conference, a significant number of authors from abroad will attend the conference for presenting their papers. I express my sincere gratitude to all the authors, speakers, reviewers, advisers and other members whose sincere efforts are the key factors for the success of this conference.

I appreciate feedback and suggestions from all the participants regarding the technical issues of this conference, which will help us to achieve more success in enhancing the quality of the upcoming conferences. I wish ICCIT 2015 all the success.

Dr. Shaikh Anowarul Fattah
Professor, Dept. of EEE, BUET

بِسْمِ اللّٰہِ الرَّحْمَنِ الرَّحِیم



MESSAGE

ORGANIZING CHAIR
ICCIT-2015

It is a matter of an immense pleasure and pride to express my heartiest thanks and gratitude to the participants attending the 18th International Conference on Computer and Information Technology (ICCIT) 2015 at the serene and tranquil environment of Military Institute of Science and Technology(MIST). I thank the ICCIT Council for their confidence on MIST as an organizer of such an international event. The objective of ICCIT 2015, with the theme "ICCIT for Innovation and Sustainable Development" is to exchange ideas and share knowledge among the scientists, scholars, engineers, educators, and technologists who have gathered here for presentation of their research works.I deeply appreciate the technical co-sponsorship of IEEE Bangladesh Section for our conference.

This year we have received huge responses from local and overseas students, faculty members and researchers. A total of 348 submissions were received from 22 countries. All these research papers have been reviewed by more than 100 reviewers from USA, UK, Canada, Australia, Japan, India, Fiji, China, Malaysia Srilanka and other European countries. After successful review of papers, 120 papers were accepted for oral presentations in the conference with a record acceptance rate of 34%. I would like to thank the learned reviewers through respected Chair, International Program Committee (IPC) for their hard work towards achieving a quality conference.To our pleasure several keynote sessions, technical talks and invited talk sessions will be organized, which will be conducted by renowned researchers from USA, India, Malaysia and Bangladesh. There will be a special session on “Roadmap to Digital Bangladesh- Role of ICT” during the inauguration session, which opens the mind of the researchers beyond one’s own field by looking into complementary fields in the context of Bangladesh.

I gratefully acknowledge the financial support and the sponsorship from all the sponsoring organizations towards successful completion of the conference events.Our special thanks and gratitude go to RobiAxiata Limited for their platinum sponsorship of this prestigious conference.

I deeply express my gratitude and thanks to the Commandant, MIST and Chief Patron, Engineer-in-Chief, Bangladesh Army for their continuous support in carrying out all the activities of the conference.My special thanks go to Professor Dr. AtaulKarim, University of Massachusates, USA, the architecture of ICCIT for guiding us in all aspects of the conference.

I would also like to express my sincere appreciations to Professor Dr. Kaykobad, Chair, Advisory Committee of ICCIT 2015, who has always been beside me like a true guardian whenever I asked for. I also like to thank all my team members for their sincere efforts and dedication towards successful completion of the conference events.

I hope you will enjoy the conference through your active participation and plan to contribute to future events of ICCIT as authors, speakers, and volunteers. Wish you all the best during the conference and hope that you have time during your visit to explore and enjoy our green Bangladesh.

Gp Capt Md. Afzal Hossain
Department of Computer Science and Engineering (CSE)
Military Institute of Science and Technology (MIST)

بِسْمِ اللّٰہِ الرَّحْمَنِ الرَّحِیم



MESSAGE

CEO
Robi Axiata Limited

It gives me immense pleasure to learn that Military Institute of Science and Technology (MIST)is organizing the 18th International Conference on Computer and Information Technology (ICCIT'2015). Robi is truly honored to be associated with this international conference for two consecutive years. We believe that our engagement with this knowledge centric conference demonstrates our commitment to foster innovation in the ICT sector.

ICT has made enormous strides in the recent times. Greater use of ICT in all spheres is changing the face of human life for the better. It is satisfying to note that Bangladesh is confidently marching ahead to realize Digital Bangladesh with wide-spread adoption of ICT technology. As a leading mobile phone of operator, we take special pride in partnering with the government in this noble mission.

ICCIT over the years has been known to promote innovation at the international level. I am sure that the 18th edition of the conference will also provide opportunity to the Computer and Information Technology professionals, scientists, engineers, educators, students and researchers from all over the world to exchange their scientific views, ideas and thoughts. As an innovative mobile phone operator, Robi keenly awaits the outcome of the international conference.

Robi is pledge bound to facilitate its subscribers to Ignite the Power Within through introducing innovative products and services. With increased use of Digital Service in the country, we are observing a growing trend among the consumers to rely on mobile technology for carrying out various mobile-commerce related activities. This throws open a completely new dimension for the industry growth. This new phase of growth entails greater integration of mobile technology with ICT. Robi stands ready to innovate its way into this unchartered territory by leading the industry in innovation.

I would like to take this opportunity to congratulate the contributors, editorial board members and other organizing bodies for working tirelessly with dedication, commitment and excellence to make the ICCIT'2015a grand success.

Supun Weerasinghe

بِسْمِ اللّٰہِ الرَّحْمَنِ الرَّحِیم



MESSAGE

CCPO
Robi Axiata Limited

I would like to congratulate Military Institute of Science and Technology (MIST) for hosting the 18th International Conference on Computer and Information Technology (ICCIT'2015). As we are at the cusp of realizing Digital Bangladesh, I am sure this conference will pave the way for greater incorporation of ICT in the development process.

Having made tremendous progress against the Millennium Development Goals (MDG), Bangladesh is poised to continue to lead the developing world in delivering against the targets set in the Sustainable Development Goals (SDG). We see ICT playing the role of a catalyst in achieving these targets.

As a responsible operator Robi has already made the basic internet platform of Facebook "Free Basics" available for all in Bangladesh. Furthermore, we have set-up Internet Corner in all the Divisional public libraries in Bangladesh providing opportunity for the youth to access free internet to supplement their knowledge acquisition. Besides, we have taken up a project named "Internet4Youth" to make our youth aware of the proper use of Internet. At Robi, we see Internet as the primary tool for realizing the vision of Digital Bangladesh. Hence, we devote a lot of our Corporate Responsibility (CR) project for the promotion of Internet in the country.

Over the years, ICCIT has come to be seen as the platform for the professionals, scientists, engineers, educators, students and researchers from all over the world to exchange their scientific views, ideas and thoughts. As the leading mobile phone operator, we celebrate this august gathering and are proud of our association for the second consecutive year.

I wish the organizers of ICCIT'2015 a grand success. Hope you continue to enlighten the international community with your thoughts on the future of ICT.

Matiul Islam Nowshad

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Conference Committee

Chief Patron
Maj Gen Md Siddiqur Rahman Sarker, SGP, hdmc, psc
Engineer-in-Chief, Bangladesh Army

Conference Chair
Prof. Mohammad A. Karim
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Program Schedule

21 December 2015	22 December 2015	23 December 2015
Registration 08:30am-09:00am	Registration 08:30am-09:00am	Registration 08:15am-09:00am
Inauguration Ceremony 08:50am-10:30am	Keynote Address -4 09:15am-10:00am	Parallel Session (E1-E4) 09:00am-10:00am
	Invited Talk -1 10:00am-10:30am	Tea Break 10:00am-10:15am
Inauguration of Project Show 10:30am-11:00am	Invited Talk -2 10:30am-11:00am	Presentation by Robi Axiata Ltd 10:15am-11:15am
Plenary Session Keynote Address (1-3) 11:15am-01:30pm	Tea Break 11:00am-11:30am	Parallel Session (F1-F4) 11:15am -12:15pm
	Parallel Sessions (A1-A4) 11:30am-12:30pm	Invited Talk-3 12:15pm-01:00pm
Lunch and Prayer Break 01:30pm-02:15pm	Lunch and Prayer Break 12:30pm-01:30pm	Lunch and Prayer Break 01:00pm-02:15pm
Panel Discussion 02:15pm-04:30pm	Presentation by Robi Axiata Ltd 01:30pm-02:00pm	Parallel Session (G1-G4) 02:15pm-03:15pm
	Tech Talk Session-1 02:15pm-03:00pm	IEEE BDS Session 03:15pm-04:15pm
	Parallel Sessions (B1-B4) 03:00pm-04:00pm	Parallel Session (H1-H4) 04:15pm-05:15pm
Prayer and Tea Break 04:00pm-04:15pm	Prayer and Tea Break 04:00pm-04:15pm	Prayer and Tea Break 05:15pm-06:00pm
Speeches (Chair of Advisory Committee, CEO of Robi Axiata Ltd., and Organizing Chair) 04:30pm-04:50pm	Parallel Sessions (C1-C4) 04:15pm-05:15pm	Closing Ceremony, Cultural Program and Conference Dinner 06:00pm-10:00pm
Prayer and Tea Break 04:50pm-05:05pm	Prayer and Tea Break 05:15pm-06:00pm	
	Parallel Sessions (D1-D4) 06:00pm-07:00pm	

ICCIT 2015 Technical Session Schedule

Technical Session: Day 1- Parallel Session: A1		
Venue: Room No. 501, General Mustafiz Tower, MIST **Date:** 22/12/2015 **Time:** 11:30-12:30		
Title: Algorithms I		
A1-1	83	Joint Texture and Depth Coding using Cuboid Data Compression
A1-2	169	A Motion Detection Algorithm for Video-polysomnography to Diagnose Sleep Disorder
A1-3	197	Design of Multi-objective UPFC Employing Backtracking Search Algorithm for Enhancement of Power System Stability

Technical Session: Day 1- Parallel Session: A2		
Venue: Room No. 502, General Mustafiz Tower, MIST **Date:** 22/12/2015 **Time:** 11:30-12:30		
Title: Artificial Intelligence		
A2-1	249	An Intelligent Framework for Text-to-Emotion Analyzer
A2-2	251	Cross-breed type Bayesian Network based Intrusion Detection System (CBNIDS)
A2-3	353	Detection and Classification of Diabetic Retinopathy Using K-Means Clustering and Fuzzy Logic

Technical Session: Day 1- Parallel Session: A3		
Venue: Room No. 504, General Mustafiz Tower, MIST **Date:** 22/12/2015 **Time:** 11:30-12:30		
Title: Bangla Language Processing		
A3-1	145	An Empirical Study on constructing the Bangla Dirukto Shobdo for Universal Networking Language (UNL)
A3-2	308	A Fuzzy Features Based Online Handwritten Bangla Word Recognition Framework
A3-3	329	A New Stroke Matching based Approach to Recognize Bangla Handwritten Text

Technical Session: Day 1- Parallel Session: A4		
Venue: Room No. 505, General Mustafiz Tower, MIST **Date:** 22/12/2015 **Time:** 11:30-12:30		
Title: Natural Language Processing		
A4-1	95	Automatic Bengali News Documents Summarization by Introducing Sentence Frequency and Clustering
A4-2	274	Bangla Parts-of-Speech Tagging using Bangla Stemmer and Rule based Analyzer
A4-3	192	Acoustic Modeling using Deep Belief Network for Bangla Speech Recognition
A4-4	352	Phoneme based Bangla Text to Speech Conversion

ICCIT 2015 Technical Session Schedule

Technical Session: Day 1- Parallel Session: B1		
Venue: Room No. 501, General Mustafiz Tower, MIST **Date:** 22/12/2015 **Time:** 15:00-16:00		
Title: Pattern Regognition and ANN I		
B1-1	82	An approach to empirical Optical Character recognition paradigm using Multi-Layer Perceptorn Neural Network
B1-2	282	Many-core Accelerated Local Outlier Factor (LOF) based Classifier in Bearing Fault Diagnosis
B1-3	376	PCA and Back-Propagation Neural Network Based Face Recognition System

Technical Session: Day 1- Parallel Session: B2		
Venue: Room No. 502, General Mustafiz Tower, MIST **Date:** 22/12/2015 **Time:** 15:00-16:00		
Title: Computer Graphics and Multimedia		
B2-1	91	Speech based text correction tool for the visually impaired
B2-2	157	An Efficient Method for Video Summarization using Moving Object Information
B2-3	180	Fast Inter-Mode Decision Strategy for HEVC on Depth Videos
B2-4	209	A simple approach to count and track underwater fishes from videos

Technical Session: Day 1- Parallel Session: B3		
Venue: Room No. 504, General Mustafiz Tower, MIST **Date:** 22/12/2015 **Time:** 15:00-16:00		
Title: Computer Network and Data Communication I		
B3-1	51	NEDindex: A new metric for community structure in networks
B3-2	63	Handover Management in Heterogeneous Network
B3-3	140	Resource Allocation for Sum-Power Minimization in Multiuser OFDM with User Rate Constraints

Technical Session: Day 1- Parallel Session: B4		
Venue: Room No. 505, General Mustafiz Tower, MIST **Date:** 22/12/2015 **Time:** 15:00-16:00		
Title: Computer Network and Data Communication II		
B4-1	299	Near Optimal Resource Allocation Algorithm for Users with Proportional Data Rate Fairness in MU-OFDM Systems
B4-2	305	A Construction Method and Data Migration Schedule for Hybrid Cloud Storage
B4-3	341	Free-Space Optical Communication with BPSK Subcarrier Intensity Modulation in Presence of Atmospheric Turbulence and Pointing Error

ICCIT 2015 Technical Session Schedule

Technical Session: Day 1- Parallel Session: C1		
Venue: Room No. 501, General Mustafiz Tower, MIST **Date:** 22/12/2015 **Time:** 16:15-17:15		
Title: Electronics I		
C1-1	18	Custom MPPT Design of Solar Power Switching Network for Racing Car
C1-2	15	Comparison Study Of Position Sensorless Control Based Back-EMF Estimators in PMSM
C1-3	148	A novel approach to obtain trajectories of targets from laser scanned datasets
C1-4	365	Tunable Bandgap and Wavelength range of Zinc Blende Indium Gallium Nitride Quantum Dots

Technical Session: Day 1- Parallel Session: C2		
Venue: Room No. 502, General Mustafiz Tower, MIST **Date:** 22/12/2015 **Time:** 16:15-17:15		
Title: Computer Network and Data Communication III		
C2-1	165	Analytical Evaluation of BER Performance of a Power Line Communication System Using Symmetrical Alpha Stable (SαS) Impulsive Noise Model
C2-2	348	PMD Monitoring of Polarization Division Multiplex Transmission System Using RF Tone Harmonics
C2-3	377	A Wideband Stacked Patch-Ring Antenna with Corner Perturbations for Circular Polarization

Technical Session: Day 1- Parallel Session: C3		
Venue: Room No. 504, General Mustafiz Tower, MIST **Date:** 22/12/2015 **Time:** 16:15-17:15		
Title: Electronics II		
C3-1	78	Proposal of a Simple Structure Photinic Crystal Fiber for Lower Indexed Chemical Sensing
C3-2	103	Crystal orientation dependent performance of cubic InGaN QW blue-violet laser
C3-3	306	Phonon Spectrum and Group velocity calculation of Cubic Semiconductor Quantum Dot

Technical Session: Day 1- Parallel Session: C4		
Venue: Room No. 505, General Mustafiz Tower, MIST **Date:** 22/12/2015 **Time:** 16:15-17:15		
Title: System Security and Cloud Computing		
C4-1	38	Trust Based D2D Communications for Accessing Services in Internet of Things
C4-2	70	Secure Outage Performance Analysis for Multicasting with Linear Equalization
C4-3	123	An Improved Bug Localization using Structured Information Retrieval and Version History
C4-4	315	Securely Outsourcing Large Scale Eigen Value Problem to Public Cloud

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Technical Session: Day 1- Parallel Session: D1		
Venue: Room No. 501, General Mustafiz Tower, MIST **Date:** 22/12/2015 **Time:** 18:00-19:00		
Title: Image Processing and Computer Vision I		
D1-1	142	Clustering and Detection of Good and Bad Rail Line Anchors from Images
D1-2	159	Watermarking Approach of Embedding Patient Facial Information into RONI of Brain CT scan Image
D1-3	297	Towards Real-time 3D Geometric Nonlinear Diffusion Filter and Its Application to CT and MR Imaging

Technical Session: Day 1- Parallel Session: D2		
Venue: Room No. 502, General Mustafiz Tower, MIST **Date:** 22/12/2015 **Time:** 18:00-19:00		
Title: Wireless Communication I		
D2-1	47	On the Downlink SINR and Outage Probability of Stochastic Geometry Based LTE Cellular Networks with Multi-Class Services
D2-2	71	Extremely Randomized Trees for Wi-Fi Fingerprint-based Indoor Positioning
D2-3	130	Self Organized Sensor Deployment with Brownian Motion in Wireless Sensor and Robot Networks
D2-4	158	Performance Analysis of a Multi-antenna Based Cooperative Relaying Scheme over Fading Channels in Spectrum Sharing Environment

Technical Session: Day 1- Parallel Session: D3		
Venue: Room No. 504, General Mustafiz Tower, MIST **Date:** 22/12/2015 **Time:** 18:00-19:00		
Title: Software Engineering I		
D3-1	49	Better User Recommendations using Enhancing Software Development Process Repository
D3-2	116	SAL:An effective method for Software Defect Prediction
D3-3	195	FP-ANK: An Improvised Intrusion Detection System with Hybridization of Neural Newtork and K-Means Clustering over Feature Selection by PCA

Technical Session: Day 1- Parallel Session: D4		
Venue: Room No. 505, General Mustafiz Tower, MIST **Date:** 22/12/2015 **Time:** 18:00-19:00		
Title: Knowledge and Data Engineering		
D4-1	20	Map Matching for Error Prone GPS data on a Sparse Road Network and Predicting Travel Time of a Route
D4-2	73	Clustered and Smarter Web mining using Semantic Web
D4-3	270	Spatial Data Visualization Methodologies in ICT4D Research
D4-4	354	Friend Recommendation Framework for Social Networking Sites using User's Online Behavior

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Technical Session: Day 2- Parallel Session: E1		
Venue: Room No. 501, General Mustafiz Tower, MIST **Date:** 23/12/2015 **Time:** 09:00-10:00		
Title: Information System and HCI		
E1-1	87	Reliability Analysis of Automated Pond Oxygen Management System
E1-2	102	A conceptual framework for design of mobile governance in developing countries: the case of Bangladesh
E1-3	163	Regulatory Requirements Compliance in E-Government Service Development
E1-4	287	Exploring the Intuitiveness of Iconic,Textual and Icon with Texts Signs for Designing User-Intuitive Web Interfaces

Technical Session: Day 2- Parallel Session: E2		
Venue: Room No. 502, General Mustafiz Tower, MIST **Date:** 23/12/2015 **Time:** 09:00-10:00		
Title: Electronics III		
E2-1	183	Optimization of 2x2 MZI Electro-Optic Switch and Its Application as Logic Gate
E2-2	317	An Efficient Design of Adder/Subtractor Circuit using Quantum Dot Cellular Automata
E2-3	371	Design of High Performance and Ultra-Thin CdTe Solar Cells with SnTe BSF from Numerical Analysis

Technical Session: Day 2- Parallel Session: E3		
Venue: Room No. 504, General Mustafiz Tower, MIST **Date:** 23/12/2015 **Time:** 09:00-10:00		
Title: Robotics		
E3-1	222	Electrical Pole Climbing Robot
E3-2	266	MAYA : A Fully Functional Rover Designed for the Mars Surface
E3-3	331	A Novel Design of a Robotic Vehicle for Rescue Operation
E3-4	337	Light Following & Obstacle Avoiding Robot using Autonomous & Android Based Manual Controller

Technical Session: Day 2- Parallel Session: E4		
Venue: Room No. 505, General Mustafiz Tower, MIST **Date:** 23/12/2015 **Time:** 09:00-10:00		
Title: Software Engineering II		
E4-1	115	Adaptive Beamforming with a Microphone Array
E4-2	179	Forecasting US NASDAQ Stock Index Values using Hybrid Forecasting Systems
E4-3	208	Performance Analysis of an FSO Link in Presence of Pointing Error Using Multiple PIN Photodetectors with Equal Gain Combiner
E4-4	343	TYPEHEX Keyboard: A virtual keyboard for faster typing in Smartphone

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Technical Session: Day 2- Parallel Session: F1		
Venue: Room No. 501, General Mustafiz Tower, MIST **Date:** 23/12/2015 **Time:** 11:15-12:15		
Title: Ubiquitous Computing		
F1-1	39	Study of ICU Patient Condition Alert Generation Process using D2D under LTE network
F1-2	166	Android Assistant EyeMate for Blind and Blind Tracker
F1-3	228	A Review on Diabetes Patient Lifestyle Management Using Mobile Application
F1-4	362	A Proactive Approach for Context-Aware Self-Adaptive Mobile Applications to Ensure Quality of Service

Technical Session: Day 2- Parallel Session: F2		
Venue: Room No. 502, General Mustafiz Tower, MIST **Date:** 23/12/2015 **Time:** 11:15-12:15		
Title: Electronics IV		
F2-1	76	Transient Anode Voltage Modeling of IGBT and Its Base Doping Profile Investigation
F2-2	232	Performance Analysis of Dispersion and Nonlinear Characteristics of a Photonic Crystal Fiber (PCF) with GeO2 Core and Defected Cladding
F2-3	373	Dielectric Gratings for Efficient Light Trapping in Thin-Film Silicon Solar Cell

Technical Session: Day 2- Parallel Session: F3		
Venue: Room No. 504, General Mustafiz Tower, MIST **Date:** 23/12/2015 **Time:** 11:15-12:15		
Title: Digital Signal Processing		
F3-1	40	Cough Detection using Speech Analysis
F3-2	220	An Efficient and Blind Audio Watermarking Technique in DCT Domain
F3-3	367	Using Polynomial Distribution in Electromagnetic Band Gap Microstripline Low-Pass Filter to Identify Highly Efficient Substrate

Technical Session: Day 2- Parallel Session: F4		
Venue: Room No. 505, General Mustafiz Tower, MIST **Date:** 23/12/2015 **Time:** 11:15-12:15		
Title: Image Processing and Computer Vision II		
F4-1	200	Computer Vision Based Bengali Sign Word Recognition Using Contour Analysis
F4-2	241	Noise Adaptive Binary Pattern for Face Image Analysis
F4-3	253	A Belief Rule Based Expert System to Assess Lung Cancer under Uncertainty

ICCIT 2015 Technical Session Schedule

Technical Session: Day 2- Parallel Session: G1		
Venue: Room No. 501, General Mustafiz Tower, MIST **Date:** 23/12/2015 **Time:** 14:15-15:15		
Title: Algorithms II		
G1-1	33	Cohesion Based Personalized Community Recommendation System
G1-2	271	Minimizing the Interference Leakage Using A Novel IA Algorithm to Provide Perfect Alignment Solutions
G1-3	37	An Effective Approach for Relevant Paragraph Retrieval in Question Answering Systems

Technical Session: Day 2- Parallel Session: G2		
Venue: Room No. 502, General Mustafiz Tower, MIST **Date:** 23/12/2015 **Time:** 14:15-15:15		
Title: Bioinformatics		
G2-1	107	A new approach in pattern matching: Codon Detection in DNA and RNA using Hash Function (CDDRHF)
G2-2	193	Context Likelihood of Relatedness with Maximal Information Coefficient for Gene Regulatory Network Inference
G2-3	210	An Efficient REDCap Based Data Collection Platform for the Primary Immune Thrombocytopenia and Its Analysis Over the Conventional Approaches

Technical Session: Day 2- Parallel Session: G3		
Venue: Room No. 504, General Mustafiz Tower, MIST **Date:** 23/12/2015 **Time:** 14:15-15:15		
Title: Information Systems I		
G3-1	27	A Study on Low Cost Solar Powered Wheel Chair for Disabled People of Bangladesh
G3-2	59	Smart Taxi Control System: Bangladesh Perspective
G3-3	199	A Wearable Sensor Based Elderly Home Care System in a Smart Environment

Technical Session: Day 2- Parallel Session: G4		
Venue: Room No. 505, General Mustafiz Tower, MIST **Date:** 23/12/2015 **Time:** 14:15-15:15		
Title: Pattern Regognition and ANN II		
G4-1	9	Evaluation of Different SVM Kernels for Predicting Customer Churn
G4-2	288	Fuzzy Membership Function Generation using DMS-PSO for the Diagnosis of Heart Disease
G4-3	368	Isolated Bangla Word Recognition and Speaker Detection by Semantic Modular Time Delay Neural Network (MTDNN)

ICCIT 2015 Technical Session Schedule

Technical Session: Day 2- Parallel Session: H1		
Venue: Room No. 501, General Mustafiz Tower, MIST **Date:** 23/12/2015 **Time:** 16:15-17:15		
Title: Wireless Communication II		
H1-1	187	Implementation of Remote Wireless Communication Laboratory for Enhancing Engineering Education in Developing Countries
H1-2	218	An Improved Position based Power-Aware Routing Algorithm in Mobile Ad-hoc Networks
H1-3	245	An Efficient Security Architecture for Wireless Sensor Networks using Pseudo-inverse Matrix

Technical Session: Day 2- Parallel Session: H2		
Venue: Room No. 502, General Mustafiz Tower, MIST **Date:** 23/12/2015 **Time:** 16:15-17:15		
Title: Electronics V		
H2-1	133	Optimized Designs of Reversible Fault Tolerant BCD adder and Fault Tolerant Reversible Carry Skip BCD Adder
H2-2	136	Optimal Design of a Low Power UWB LNA for 5−10 GHz Application
H2-3	175	Performance Limitations of a WDM Coherent Optical Transmission System due to Raman Amplifier Induced Crosstalk

Technical Session: Day 2- Parallel Session: H3		
Venue: Room No. 504, General Mustafiz Tower, MIST **Date:** 23/12/2015 **Time:** 16:15-17:15		
Title: Information Systems II		
H3-1	36	A Semantic-Based Technique for Question Classification in Question Answering Systems - A Hybrid Approach
H3-2	64	Applying the Technology Acceptance Model in examining Bangladeshi consumers' behavioral intention to use Mobile Wallet: PLS-SEM Approach
H3-3	226	Development of National Health Data Warehouse Bangladesh: Privacy Issues and a Practical Solution
H3-4	258	Espionage: A voice guided surveillance robot with DTMF control and web based control

Technical Session: Day 2- Parallel Session: H4		
Venue: Room No. 505, General Mustafiz Tower, MIST **Date:** 23/12/2015 **Time:** 16:15-17:15		
Title: IT in Bangladesh		
H4-1	22	PoE (Power over Ethernet) switch based remote power control system for the better performance of ISPs in Bangladesh
H4-2	74	Analysis of Real Time Frequency Transients and Inertia Estimation of Bangladesh Power System
H4-3	135	Rain Attenuation Prediction Analysis and Contour Map Design over Bangladesh
H4-4	369	Semantic Annotation of Bangla News Stream to Record History



Keynote Speaker

Dr. Saifur Rahman
Life Fellow - IEEE
Joseph Loring Professor & Director
VT Advanced Research Institute
Arlington, Virginia, USA

Challenges & Opprortunities in Renewable Energy: Role of the Smart Grid

Abstract

With the focus on environmental sustainability and energy security, power system planners are looking at renewable energy as supplements and alternatives. But such generation sources have their own challenges - primarily intermittency. Many believe that the smart grid – due to its inherent communication, sensing and control capabilities – will have the ability to manage the load, storage and generation assets (including renewables) in the power grid to enable a large-scale integration of distributed generation. In a smart grid, information about the state of the grid and its components can be exchanged quickly over long distances and complex networks. It will therefore be possible to have the integration of sustainable energy sources, such as wind, solar, off-shore electricity, etc. for smoother system operation. But in order for this to be possible, the electric utility will have to evolve, and change their ways of operation to become an intelligent provider of these services. This lecture introduces the operational characteristics of renewable energy sources, and various aspects of the smart grid - technology, standards and regulations. It also addresses the interplay among distributed generation, storage and conventional generation to provide an efficient operational strategy in the context of the smart grid.

Short Bio

Professor Saifur Rahman is the founding director of the Advanced Research Institute (www.ari.vt.edu) at Virginia Tech where he is the Joseph R. Loring professor of electrical and computer engineering. He also directs the Center for Energy and the Global Environment (www.ceage.vt.edu). He is a Fellow of the IEEE and an IEEE Millennium Medal winner. He is the founding editor-in-chief of the IEEE Electrification Magazine. He was also the founding editor-in-chief of IEEE Transactions on Sustainable Energy. He is the President-elect of the IEEE Power and Energy Society (PES) for 2016 and 2017, and currently serving as a member of the Board of Governors of the IEEE Society on Social Implications of Technology (SSIT). In 2006 he served on the IEEE Board of Directors as the vice president for publications. He served as the chair of the US National Science Foundation Advisory Committee for International Science and Engineering from 2010 to 2013. He is a Distinguished Lecturer for the IEEE Power & Energy Society, and has lectured on smart grid, energy efficiency, renewable energy, demand response, distributed generation and critical infrastructure protection topics in over 30 countries on all six continents.

Keynote Speaker

Dr. Ekram Hossain
Professor, Fellow IEEE
Department of Electrical and Computer Engineering
University of Manitoba, Winnipeg, Canada.



5G Cellular: Key Enabling Technologies and Research Challenges

Abstract

To satisfy the ever-increasing demand for mobile broadband communications, the IMT-Advanced (IMT-A) standards have been ratified by the International Telecommunications Union (ITU) in November 2010 and the fourth generation (4G) wireless communication systems are currently being deployed worldwide. In addition, the standardization for LTE Release-12, also known as LTE-B has been finalized. However, it is expected that by 2020, there will be a thousand-fold increase in total mobile broadband traffic (e.g., contributed by new applications and services such as pervasive 3D multimedia, HDTV, gaming, etc.) which need to be carried by the cellular wireless networks. Today's wireless systems fall short of the 2020 demands and therefore significant research and development effort will be required over the next decade. In this context, the fifth generation (5G) mobile and wireless communication technologies are emerging. The 5G cellular wireless networks are envisioned to provide 1000 times higher data rates, enhanced end-user quality-of-experience (QoE), reduced end-to-end latency, and lower energy consumption. Starting with the visions and requirements for 5G cellular networks, I will present several emerging technologies, which will enable and define the 5G mobile communications standards. I will discuss the major research problems, which these new technologies will breed in the context of 5G systems.

Short Bio

Ekram Hossain (http://home.cc.umanitoba.ca/~hossaina) is a Professor in the Department of Electrical and Computer Engineering at University of Manitoba, Winnipeg, Canada, where he leads the Wireless Communications, Networks, and Services (WiCoNS) research group. He received his Ph.D. in Electrical Engineering from University of Victoria, Canada, in 2001. He was a University of Victoria Fellow. Dr. Hossain's current research interests include design, analysis, and optimization of wireless/mobile communication networks with emphasis on fifth generation (5G) networks, cognitive and green radio systems, and network economics. He has authored/edited several books in these areas. His research works have been highly cited with more than 11,700 citations in Google Scholar and h-index pf 55. He was elevated to an IEEE Fellow "for contributions to spectrum management and resource allocation in cognitive and cellular radio networks". Currently, he serves as the Editor-in-Chief for the IEEE Communications Surveys and Tutorials and an Editor for IEEE Wireless Communications. Also, he is a member of the IEEE Press Editorial Board. Previously, he served as the Area Editor for the IEEE Transactions on Wireless Communications in the area of "Resource Management and Multiple Access" from 2009-2011, an Editor for the IEEE Transactions on Mobile Computing from 2007-2012, and an Editor for the IEEE Journal on Selected Areas in Communications - Cognitive Radio Series from 2011-2014. Dr. Hossain has won several research awards including the IEEE Communications Society Transmission, Access, and Optical Systems (TAOS) Technical Committee's Best Paper Award in IEEE Global Communications Conference (Globecom 2015), University of Manitoba Merit Award in 2010 and 2014 (for Research and Scholarly Activities), the 2011 IEEE Communications Society Fred Ellersick Prize Paper Award, and the IEEE Wireless Communications and Networking Conference 2012 (WCNC'12) Best Paper Award. He is a Distinguished Lecturer of the IEEE Communications Society (2012-2015). He is a registered Professional Engineer in the province of Manitoba, Canada.



Keynote Speaker

Dr. Mohammad Saifur Rahman
Associate Professor of Management
Krannert School of Management, Purdue University

Our New Technology-Driven Realities: Omnichannel Shopping and the Concierge Model

Abstract

In a world where consumers have access to a vast amount of information through widespread technologies such as smartphones and tablets, a key mantra for success in omnichannel retailing is the concierge model to be able to serve the consumer by being an advisor. These hyper-connected consumers are leaving digital traces everywhere. Through technological advances, e.g., apps, geo-fencing, facial recognition, clickstream analysis, etc., retailers can capture these traces to be an effective concierge, capable of delivering superior personalized experiences to consumers. Whether it is a smartphone app or a sales associate, the concierge must be equipped with valuable data-driven insights to serve the consumer properly. It is, therefore, ever more important to understand how different types of information that consumers collect affect their behavior, e.g., purchasing and return patterns. Toward this end, retailers have been making significant investments in web technologies.

Broadly speaking, there are two types of web technologies – navigational and product oriented. Navigational technologies, namely, search and recommendation, are meant to steer a consumer to an appropriate product page. Once the consumer is there, product-oriented technologies, e.g., alternative photos, zoom, and color swatch, are meant to assist her in gathering specific information on this product. Consequently, it is critical for retailers to evaluate the impact of these technologies on sales and returns. We are among the first to empirically examine these issues in an extensive manner and provide important managerial insights.

Short Bio

Professor Mohammad Saifur Rahman's research program is primarily focused on digital business, technology usage, retail and web analytics, consumer behaviour, and decision making. He has published in major journals including Management Science, Information Systems Research, and MIT Sloan Management Review. His papers have also been accepted in several leading conferences, including Workshop on Information Systems Economics (WISE), International Conference on Information Systems (ICIS), and Conference on Information System and Technology (CIST). He has been awarded multiple major Social Sciences and Humanities Research Council (SSHRC) grants to support his research. He co-chaired 2013 Conference on Information Systems and Technology (CIST) and currently serving as the president of INFORMS eBusiness Society.

Prior to coming back to Krannert in 2014, he was an associate professor at the Haskayne School of Business, University of Calgary, where he received the Dean's Award for Outstanding New Scholar in 2010 and the Dean's Award for Outstanding Research Achievement in 2014.

Professor Rahman's teaching interests include data-driven digital business, data management and business analytics, and Internet strategies. While teaching as a doctoral student in 2006 and 2007, he received, both times, the Certificate for Distinguished Teaching, the highest recognition at Krannert for excellence in teaching by a doctoral student.

Keynote Speaker

Dr. Phalguni Gupta
National Institute of Technical Teachers' Training & Research, Kolkata
Kolkata 700 106, INDIA



Changes in the Development of Multimodal Biometrics System

Abstract

Use of physiological or behavioral characteristics for the purpose of human authentication is very intuitive and highly acceptable in society. It helps to overcome various limitations of conventional approaches which are based on token or knowledge by using an access card, pin or password. Indissoluble properties of biometric systems have the capability to offers strong non- repudiation and non-circumvention to its users. There are various well known biometric traits such as Face, Fingerprint, Iris, Ear, Palmprint, Knuckleprint, Vein-Pattern, etc. Every trait has its pros and cons. Suitability of a particular biometric trait depends on many factors like level of user cooperation, cost, desired level of security etc. Multimodal Biometrics which makes use of more than one trait, plays a major role in the field of Individual security and is a solution to minimize the existing disadvantages of each trait.

In this talk, some of the uni-modal traits will be discussed along with their advantages and disadvantages. We have designed multi-modal biometric system which is suitable for individual security. In order to design such a system, we have faced several challenges which will be focused in the talk.

Short Bio

Dr. Phalguni Gupta received his Doctoral degree from Indian Institute of Technology Kharagpur in 1986. He started his carrier in 1983 by joining in Space Applications Centre (ISRO) Ahmedabad, India as a Scientist. In 1987, he joined the Department of Computer Science and Engineering, Indian Institute of Technology Kanpur, India. He is a Professor in the department. Currently, he is the Director of National Institute of Technical Teachers' Training and Research, Kolkata

He has published about 300 papers in International Journals and International Conferences. He is also an author of 2 books and 14 book chapters. He has dealt with several sponsored and consultancy projects which are funded by the Government. Some of these projects are in the area of Biometrics, System Solver, Grid Computing, Image Processing, Mobile Computing, and Network Flow. He has established the Biometrics Lab at IIT Kanpur.

His research interest includes Biometrics, Image Processing, Algorithms, Parallel Algorithms, On-line Algorithms.



Invited Speaker

Dr. Mahbubur Rahman Syed
Minnesota State University
Mankato
USA

Challenges in Smart Indoor Positioning System Development

Abstract

With advancement of technologies, the development of indoor intelligent devices, both autonomous and controlled, are rapidly growing to cover most aspect of human life ranging from autonomous toys to assisting flexible mobility of disable persons. Several applications require determination of coordinate positions to incorporate intelligent behavior in a device. Though in some cases coordinate identification may be achieved using GPS, but in several indoor situations GPS signal may not be available. This presentation discusses issues associated with automatic identification of indoor coordinates for design and development of indoor positioning systems with specific application to autonomous car and assisting blind people in an indoor environment.

Short Bio

Mahbubur Rahman Syed is currently a professor of Computer Information Science Department at Minnesota State University, Mankato (MSU), USA. He has more than 30 years of experience in teaching, in industry, in research and in academic leadership in the field of computer science, engineering and information technology. He worked in several universities in USA, Australia and Bangladesh in the above fields. He has been serving in different roles such as co-editor-in chief, associate editor, editorial review committee, member of several international journals. Dr. Syed has been involved in international professional activities including organizing conferences and serving as conference and program committee chair. He has co-edited several books in the area of e-commerce, software agents, distance education, multimedia systems and networking. He has more than 100 papers published in journals and conference proceedings.

Invited Speaker

Dr. Afzal Hossain
Researcher
Nanova Corporation
San Jose, California



VSIM: A Novel Platform for Vehicle Virtual Integration

Abstract

Unmanned smart crafts have been around for many decades. Today, a smart car can have hundreds of millions of lines of codes running on hundreds of processors. Electronics and electric drive trains are becoming more important than traditional electromechanical components such as gas powered engines and power trains. Although the vehicle technology is progressing rapidly, their development methodology relies on physical integration of proven subsystems in a prototyping laboratory. This trial and error method cannot detect flaws until late in the design cycle when fixing is expensive. Although advanced design tools are available, their domains remain fragmented as ever. For example, tools for electromechanical design never fully merged with tools for electronics design. The design process of smart vehicles however requires integrated thinking involving geography, civil engineering, mechanical engineering, electrical and computer engineering, computer science and so on. We introduced VSIM originally in 2003 as a novel platform for vehicle virtual integration, a proposed step in an improved design methodology. Much has changed since then. Today we define an updated problem based on what we know now. Then we show how to explore the challenges. An interesting byproduct of this discourse is a novel vision for future cars, highways, and a cyber-department of motor vehicles.

Short Bio

DR. AFZAL HOSSAIN received the BSEEE degree from BUET. He received the Ph.D. and M.S. degrees from Syracuse University. He also received an M.B.A. degree from the California State University East-Bay. His first job was at Intel Corporation in the Pentium Processor design project. His team developed most of the Electronic Design Automation tools and taped out the first twenty steppings of the original Pentium Processor. That team also had a rare opportunity to name the newly designed chip Pentium. He was soon hired for the Itanium processor design project. Shortly thereafter he became a member of the HP-Intel joint venture team for the definition of the Itanium Processor architecture. Dr. Hossain joined the University of Michigan-Dearborn in 2003 as a tenure-track professor. Recently, he has taken a leave from faculty to pursue industrial research at Nanova. Dr. Hossain serves in the organizing and technical committees of several conferences in the fields of Electrical, Electronics, and Computer Engineering. He writes and review conference and journals papers for IEEE, ACM, and ACTA. His research interests include processor architecture, chip design, and electronic design automation. Dr. Hossain likes to travel and hike.



Invited Speaker

Dr. Mohammad Tariqul Islam
Professor,
Department of Electrical,Electronic
and Systems Engineering
UniversitiKebangsaan Malaysia

High Gain S band Small Satellite Antenna Development using Optimization Algorithm

Abstract

Miniaturization technologies make feasible today, to build smaller satellites than those built a decade ago without degrading their performances. The employment of lower frequency antenna (UHF/VHF) requires large antennas due to their large wavelength. Furthermore, they do not provide sufficient bandwidth for high speed communication. Deployable, monopole and 3D antennas are unsuitable for small satellite applications as they increase complexity of operation and the possibility of failure. Small satellite antennas have to be extremely light and flexible. Printed antennas are one of the principal candidates for this kind of application, especially because of their lightweight, low profile characteristics; however, it is well-known for achieving intrinsically low gain. In the complex communication environment, high data rate communication along with uninterrupted data transfer between the terminals are of major concern. In a typical wireless communication system, increasing the gain of antennas used for transmission increases the wireless coverage range, decreases errors, increases achievable bit rates and decreases the battery consumption of wireless communication devices. One of the main factors in increasing this gain is matching the polarization of the transmitting and receiving antenna. To achieve this polarization matching, the transmitter and the receiver should have the same axial ratio, spatial orientation and the same sense of polarization. So satellite antennas require circular polarization (CP) to alleviate any orientation related issues of the receiving base station antennas. In order to miniaturize with CP radiation and optimize the performance of the proposed antenna, the Ramped Convergence Particle Swarm Optimization (RCPSO) algorithm has been used. In this speech, a circular polarized compact microstrip patch antenna has presented with low axial ratio in a large broadside beamwidth. The required S band impedance bandwidth, 3 dB axial ratio beamwidth and high gain for the proposed small satellite to operate at 2.285 GHz has achieved using the novel RCPSO. The antenna has a compact size with design simplicity and its geometry and performances are compatible with any small satellite structure. The proposed S band antenna was also integrated with a small satellite body and different test has performed such as atomic oxygen test, plasma environment test, microwave test and thermal vacuum test and mechanical stress tests.

Short Bio

Mohammad Tariqul Islam is a Professor at the Department of Electrical, Electronic and Systems Engineering of the Universiti Kebangsaan Malaysia (UKM). He is currently the group leader of the Radio Astronomy Informatics group at UKM. He is the author of over 300 research journal articles, nearly 165 conference articles, 4 research level books and a few book chapters on various topics related to antennas, microwaves and electromagnetic radiation analysis with 11 inventory patents filed. Thus far, his publications have been cited 1990 times and his H-index is 25 (Source: Scopus). He is now handling many research projects from the Malaysian Ministry of Science, Technology and Innovation and Ministry of Education, and some international research grants from Japan. His research interests include communication antenna design, radio astronomy antennas, satellite antennas, and electromagnetic radiation analysis.

Dr. Islam currently serves as the Editor-in-Chief for the International Journal of Electronics and Informatics and Associate Editor for International Journal of Antenna and Propagation and Electronics Letter. He received several International Gold Medal awards, a Best Invention in Telecommunication Award, a Special Award from Vietnam for his research and innovation, and Best Researcher Awards in 2010 and 2011 at UKM. He also won the best innovation award in 2011 and the Best Research Group in ICT niche in 2014 by UKM.

He was the recipient of Publication Award from Malaysian Space Agencyin 2014, 2013, 2010, 2009 and the Best Paper Presentation Award in 2012 International Symposium on Antennas and Propagation, (ISAP 2012) at Nagoya, Japan and in 2015 in IconSpace.He is a senior member of the IEEE and member of the Applied Computational Electromagnetic Society (ACES) and Institute of Electronics, Information and Communication Engineers (IEICE).

ICCIT 2015 Technical Session Abstracts

Technical Session 1

Technical Session : Day 1

Parallel Session A1: Algorithms I

Paper ID : 83 Joint Texture and Depth Coding using Cuboid Data Compression

Manoranjan Paul[1], Subrata Chakraborty[2], Manzur Murshed[3] and Pallab Kanti Podder[1]
[1]School of Computing and Mathematics, Charles Sturt University, Bathurst, NSW-2795, Australia
[2]School of Management and Enterprise, University of Southern Queensland, Queensland, Australia
[3]School of Information Technology, Federation University,VIC-3842, Australia
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ABSTRACT:

The latest multiview video coding (MVC) standards such as 3D-HEVC and H.264/MVC normally encodes texture and depth videos separately. Significant amount of rate-distortion performance and computational performance are sacrificed due to separate encoding due to the lack of exploitation of joint information. Obviously, separate encoding also creates synchronization issue for 3D scene formation in the decoder. Moreover, the hierarchical frame referencing architecture in the MVC creates random access frame delay. In this paper we develop an encoder and decoder frame work where we can encode texture and depth video jointly by forming and encoding 3D cuboid using high dimensional entropy coding. The results from our experiments show that our proposed framework outperforms the 3D-HEVC in rate-distortion performance and reduces the computational time significantly by reducing random access frame delay.

Paper ID : 169 A Motion Detection Algorithm for Video-polysomnography to Diagnose Sleep Disorder

Md. Zahidul Islam[1], K M Talha Nahiyan, Md. Adnan Kiber
Department of Electrical and Electronic Engineering
University of Dhaka
Dhaka, Bangladesh
Email :[1]m.islam.1989@ieee.org

ABSTRACT:

Sleep is a vital biological function. Polysomnography is usually used to determine sleep disorder but it is a partly invasive and interfering method due to attachment of many electrodes on to the body of the patient involved in monitoring process. Therefore patients already having some sort of sleep abnormality may face greater difficulty in sleeping resulting in improper diagnosis. But our proposed video-polysomnography method can overcome this problem where the whole night sleep is recorded and analyzed later. In this paper it is proposed that we can create a shortened motion video out of the whole night sleep video, containing only the movement related portions and make a motion index graph from full length sleep video. From the shortened motion video, a sleep analyst can diagnose for sleep disorder by analyzing that video in a short time. Along with this the motion index graph shows the frequency, level and timing of motion during sleep. For primary detection of sleep disorder it can be a low cost, simply implemented and noninvasive

Paper ID : 197

Design of Multi-objective UPFC Employing Backtracking Search Algorithm for Enhancement of Power System Stability

Mohammad Shoaib Shahriar[1*], Md Shafiullah[1], Mohammed Afzal Asif[2], Md Mahmudul Hasan[2], Md Rafiuzzaman[2]
[1]Department of Electrical Engineering, King Fahd University of Petroleum & Minerals, Dhahran, Kingdom of Saudi Arabia
[2]Department of Electrical & Electronic Engineering, Independent University, Dhaka, Bangladesh
Email : *shoebeee05@gmail.com

ABSTRACT:

In the arena of power system, small signal stability is one of the most important issues to be settled down. In relatively weak tie line interconnections, these low frequency oscillations are observed. Use of Flexible AC Transmission System (FACTS) devices is playing most important roles in damping out of those oscillations. Unified Power Flow Controller (UPFC), one of the key members of FACTS family is being used in long and high voltage transmission networks of modern power system. Tuning of the UPFC parameters in real time power system application is a multi-objective optimization problem. In this paper the parameters of UPFC has been optimized employing a novel optimization approach, Backtracking Search Algorithm (BSA).The efficacy of the proposed BSA tuned UPFC has been investigated by comparing the time domain simulation results with fixed gain conventional UPFC. Additionally, the Eigen values of optimized and conventional UPFC of the power system have also been compared.

ICCIT 2015 Technical Session Abstracts

Technical Session 1

Technical Session : Day 1

Parallel Session A2 : Artificial Intelligence

Paper ID : 249 An Intelligent Framework for Text-to-Emotion Analyzer

[1]Nadia Afroz, [2]Mahim-Ul Asad, [3]Lily Dey, [4]Rudra Pratap Deb Nath, [5]Muhammad Anwarul Azim
Dept. of Computer Science & Engineering, University of Chittagong
Chittagong, Bangladesh
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ABSTRACT:

The expansiveness of the internet encourages people to express their personal feelings via textual medium in terms of virtual communication. People are being influenced to move into this type of communication with the remarkable growth of social sites, messengers, blogs, micro blogs etc. Automatic derivation of the emotion from text is a challenge as it minimizes the misunderstanding by conveying the internal state of the users. Here we propose an intelligent framework to detect the emotion of a text. We divide the framework into two modules, namely Training Module and Emotion Extraction Module. We utilize the concept of Exploratory Data Warehouse (DW) technology to train our system. Therefore, DW relies not only on internal data but also on external (Web) data. The DW is used by the Emotion Extraction Module to detect the emotion of a given text. A comprehensive experimental evaluation, comparing our framework to a solution made with existing systems on a concrete dataset, shows that the proposed framework outperforms the existing approaches in terms of accuracy.

Paper ID : 251 Cross-breed type Bayesian Network based Intrusion Detection System (CBNIDS)

Abdur Rahman Onik[1*], Nutan Farah Haq [2*], Waizun Mustahin[2*]
[1]Department of IT, Opsonin Pharmaceuticals Ltd.
[2]Software Development, 8Venture-IT
[*]Dhaka, Bangladesh

ABSTRACT:

Modern day internet is victimizer of the cynical network attacks due to excessive usage and massive connectivity demands. Machine learning is an efficient approach to prevent the intrusion and classify the network attacks. This study highlights the combined power of filter approaches in intrusion detection framework. Feature selection technique removes the redundant features and builds a time consuming better-performed intrusion detector framework. This study presents a cross-breed type feature selection approach using duo filter schemes for intrusion detection. In this framework feature selection technique eliminate their relevant features to reduce the time complexity and build a better model to predict the result with a greater accuracy and Bayesian network based classification model has been built up to predict the types of attacks. The experiment shows that the proposed framework exhibits a superior overall performance in terms of accuracy which is 97.2746% and keeps the false positive rate at a lower rate of 0.008. The model shows better performance in terms of accuracy than other leading state-of-the-arts frameworks like Boosted DT, Hidden NB, KNN and Markov chain. The NSL-KDD is used as benchmark data set with Weka library functions in the experimental setup.

Paper ID : 353 Detection and Classification of Diabetic Retinopathy Using K-Means Clustering and Fuzzy Logic

Md. Jahiruzzaman, A. B. M. Aowlad Hossain
Department of Electronics and Communication Engineering
Khulna University of Engineering & Technology, Khulna-9203, Bangladesh
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ABSTRACT:

Diabetic retinopathy is a common vision threatening disease which occurs due to the abnormalities in retina of diabetic patients. Detection of diabetic retinopathy is crucial for prevention of loss of vision and diagnosis of diabetic. As fundus are sensitive to vascular syndromes, efficient detection of diabetic retinopathy related exudates and hemorrhages in fundus images of the retina can be a helpful for effective screening. This study presents an effective approach to detect exudates and hemorrhages in retinal fundus image and classify the diabetic retinopathy with reasonable cost. A k-means color compression technique is used to cluster the fundus image indifferent region of interest reducing color dimension. The different parts of diabetic fundus then segmented out and analyzed through the region properties attributes. Finally, the recognition of diabetic retinopathy was done by the knowledge based fuzzy inference system (FIS) with these effective attributes through experiment and trail basis. The sensitivity and accuracy of the detector is found as 98.2% and 92.3% respectively. The HRF retinal fundus image database images are successfully classified by fuzzy logic classifier with accuracy up to 96.67%.

ICCIT 2015 Technical Session Abstracts

Technical Session 1

Technical Session : Day 1

Parallel Session A3 : Bangla Language Processing

Paper ID : 145 An Empirical Study on constructing the Bangla Dirukto Shobdo forUniversal Networking Language (UNL)

Mahmudul Hasan[1], Md. Afzalur Rahman[2], Narayan Ranjan Chakraborty[3]
[1]Dept. of CSE, Comilla University, Comilla, Bangladesh
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ABSTRACT:

Now a day the World Wide Web (WWW) is a most triumphant communication medium. This represents revolutionary tools to communicate and access information, which enables to access innumerable documents on a huge variety of topics. Though the profusion of information, languages frequently cause troubles. Conversion from another language to Bangla language is instantly a highly demand for Bangladeshi peoples because they are inducing so rapidly on digital contracting and web resources. The Universal Networking Language (UNL)[5] deals to minimize above problems. This helps to conquer the language blockade among citizens of different nations to solve problems rising from current globalization trends. In this paper we propose the psychiatry of Bangla Dirukta Shobdo and translation of Bangla sentences to UNL expression. Here we actually are paying attention on a concept in bangla "Dirukta Shobdo" from Bangla Grammar and what are the principle of converting dirukto shobdo to UNL language and the process of implementation.

Paper ID : 308 A Fuzzy Features Based Online Handwritten BanglaWord Recognition Framework

Kanchan Chowdhury, Lamia Alam, Shyla Sarmin, Safayet Arefin, and Mohammed Moshiul Hoque
Dept. of Computer Science & Engineering, Chittagong University of Engineering & Technology,
Chittagong-4349, Bangladesh
E-mail: moshiulh@yahoo.com

ABSTRACT:

Handwriting recognition is one of the most important ways to ease the handling of information between man and machine. Online handwriting recognition can be a very attractive method when people feel inconvenient using keyboards to handle information with computing devices. The most complicated task associated with online Bangla handwritten recognition is to separate the adjacent characters and vowel signs from one another within a Bangla word. This problem becomes more complicated due to the variations of writing style of individuals. In this paper, we propose a framework to recognize handwritten Bangla words in real time considering different writing styles. We used fuzzy linguistic rules in order to recognize Bangla handwritten words. Evaluation result for various writing styles reveals that the propose framework can recognize Bangla handwritten words with 77% accuracy.

Paper ID : 329 A New Stroke Matching based Approach to Recognize Bangla Handwritten Text

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ABSTRACT:

This paper proposes stroke matching based text recognizer (SMTR), a new approach to recognize Bangla handwritten text (BHT) that mainly focuses on off-line Bangla Handwritten characters (BHCs) as well as words. For recognition, at first SMTR simplifies any font, size and shape of BHT into a set of strokes. Then it matches these strokes with its own set of strokes of Bangla characters those are already stored in the database. Here the structural properties of lots of these stored strokes are proposed by SMTR. Usually handwritten character (HC) recognition means optical character recognition and here in the accuracy of recognition is not so high because of divergences, variations and characteristics of HCs. Although up to now, lots of recognizers are available only to recognize BHCs, a recognizer that can recognize BHT is almost unavailable. Syntactic method(SM) is one of the most popular methods to recognize BHCs. SMTR proposed in this paper modifies existing strokes of SM and exploits it to recognize BHCs as well as BHT. The experimental results show that SMTR can recognize BHCs and also BHT (i.e. words) even in a noisy environment profoundly.

ICCIT 2015 Technical Session Abstracts

Technical Session 1

Technical Session : Day 1

Parallel Session A4 : Natural Language Processing

Paper ID : 95

Automatic Bengali News Documents Summarization by Introducing Sentence Frequency and Clustering

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ABSTRACT:

A method has been proposed in this paper for Bengali news documents summarization which extracts significant sentences using the four major steps (a) preprocessing,(b) sentence ranking, (c) sentence clustering, and (d) summary generation. The noticeable feature of this method is the incorporation of the sentence frequency where redundancy elimination is a consequence. Another one remarkable aspect is sentence clustering on the basis of similarity ratio among sentences. The summary sentence selection is done from all the clusters so that there will be maximum coverage of information in summary even if information is found scattered in input document. Two sets of human generated summary have been utilized where one is to train the system and another is for performance evaluation. The proposed method has been found better while turning comparison with the latest state-of-the art method of Bengali news documents summarization. The results of performance evaluation show that the average Precision, Recall and F-measure values are 0.608, 0.664 and 0.632respectively.

Paper ID : 274

Bangla Parts-of-Speech Tagging using Bangla Stemmer and Rule based Analyzer

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ABSTRACT:

Parts-of-Speech (POS) tagging plays vital roles in the field of Natural Language Processing (NLP), such as — machine translation, spell checker, information retrieval, speech processing, emotion analysis and so on. Bangla is a very inflectional language that induces many variants from a single word. Although there is a few POS Tagger in Bangla language, very small of them address the essence of suffices to identify tag of the words. In this regard, we propose an automated POS Tagging system for Bangla language based on word suffixes. In our system, we use our own stemming technique to retrieve a possible minimum root words and apply rules according to different forms of suffixes. Moreover, we incorporate a Bangla vocabulary that contains more than 45,000 words with their default tag and a patterned based verb-data-set. These facilitate to improve tagging efficiency of Bangla POS Tagger. We experiment our proposed system on a Bangla text corpus. The result shows that our proposed Bangla POS Tagger has outperformed the known related tagging systems.

Paper ID : 192 Acoustic Modeling using Deep Belief Network for Bangla Speech Recognition

Mahtab Ahmed, Pintu Chandra Shill, Kaidul Islam, Md. Abdus Salim Mollah and M. A. H. Akhand
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ABSTRACT:

Most of the Speech Recognition (SR) systems use Hidden Markov Model (HMM) for acoustic modeling and Gaussian Mixture Model (GMM) for state modeling. Artificial Neural Network (ANN) based methods are also found as a good replacement of GMMs in SR system development. This paper presents a method for Bangla SR using Deep Belief Network (DBN) which is probabilistic generative ANN composed by multiple layers of restricted Boltzmann machine along with HMM. At first Mel Frequency Cepstral Coefficients is used extract features from the speech data. Then DBN is trained with these feature vectors to calculate each of the phoneme states. After that Viterbi decoder is used to determine the resulting hidden state sequence that generates the word. The training of DBN is performed in two steps. At first generative pre training is used to train the network layer by layer. In the second step, enhanced gradient is used to slightly adjust the model parameters to make it more accurate. Total 840utterances (20 utterances for each of 42 speakers) of the words are used in this study. The proposed method is shown satisfactory recognition accuracy and outperformed other prominent existing methods.

Paper ID : 352 Phoneme based Bangla Text to Speech Conversion

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ABSTRACT:

This paper presents a phoneme based Bangla Text to Speech (TTS) Synthesis frame work which uses a new approach for recording Bangla phoneme to improve the speech quality. Main objective of our method is to produce more natural speech sound during Bangla text to speech conversion. In this approach, the size of the dictionary remains small, but produces more smooth and natural sounds than any other phoneme, syllable or diphone based approaches. In the proposed framework, the voice sound of each Bangla alphabet is recorded. Afterwards, the recorded voice sound is separated into their constituent phonemes by a voice cutter. This dataset can be used for future conversion of input text into its corresponding natural sounding speech from a sequence of phonemes. Before generating the phonemes sequence for each word, we normalized the text by considering numbers, abbreviations, acronyms, currency, dates and URLs. Our implemented system supports UNICODE input for Bangla text.

ICCIT 2015 Technical Session Abstracts

Technical Session 2

Technical Session: Day 1

Parallel Session B1 : Pattern Recognition and ANN I

Paper ID : 82

An approach to empirical Optical Character recognition paradigm using Multi-Layer Perceptorn Neural Network

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ABSTRACT:

In this paper we are represent the architecture of Optical Character Recognition that converting from visual character to the machine readable format. To present this architecture, several stages are associate like take the character input image, preprocessing the image, feature extraction of the image and at last take a decision by the artificial computational model same as biological neuron network. Decision making system by the Artificial Neural Network associated with two steps; first is adapted the artificial neural network throughout the Multi-Layer Perceptron learning algorithm and second is recognition or classification process for the character image to comprehensible for the machine in a way that what character isit. Our proposal architecture achieved 91.53% accuracy to recognize the isolated character image and 80.65% accuracy for the sentential case character image.

Paper ID : 282 Many-core Accelerated Local Outlier Factor based Classifier in Bearing Fault Diagnosis

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ABSTRACT:

This paper proposes a feature extraction, selection, and classification based bearing fault diagnosis methodologies using acoustic emission (AE) signal. First, a set of statistical, time-domain, and frequency domain features are extraction from AE signal. Of these features, some features having more informative data to distinguish faults are selected. Finally, a classifier based on local outlier factor (LOF) is used to detect faults of bearing. LOF consists of calculating distances of each input will all the training features, thus having a lot of computations. To reduce execution time, this paper implemented the LOF on a data parallel many-core architecture. Experimental results showed that, many-core implementation of LOF algorithm is more than 923× faster than sequential implementation.

Paper ID : 376 PCA and Back-Propagation Neural Network Based Face Recognition System

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ABSTRACT:

It's very difficult for an intelligent control system to recognize a person accurately as like humans. Though face recognition has some grand difficulties because of facial expression, illumination, lighting condition, pose etc., but the recognition of faces is very important for many applications such as: video surveillance, retrieval of an identity from a database for criminal investigations, home and office security, face book and forensic applications. Within the last decade, the technological revolution has taken place all over the world based on computer vision. Face recognition has proved to be a challenging problem in computer vision. So, researches of computer science, biometrics, pattern recognition and neuroscientists have shown their deep interest in developing a consistent and proficient face recognition system. In this paper, we have proposed a method for face recognition by combining PCA and Back-propagation neural network which efficiently works in a constrained environment. Experiments demonstrate good results for face recognition on AT&T(ORL) database.

ICCIT 2015 Technical Session Abstracts

Technical Session 2

Technical Session: Day 1

Parallel Session B2 : Computer Graphics and Multimedia

Paper ID : 91 Speech based text correction tool for the visually impaired

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ABSTRACT:

In this modern age of revolutionary smart devices, technology reigns supreme. Visually impaired users are a part of this modern world. They deserve to taste the beauty of this technology. However, they require assistive technology which is the concern of HCI (Human Computer Interaction). In this paper, we present a text correction tool that is entirely designed for the visually impaired. Instead of having to use traditional keyboard or mouse, they can write or edit text using speech only. The text can be read to the user using speech synthesizer. The user will be notified of different events through audio feedback and the user will be able to write text entirely using speech. Different voice commands have been designed to interact with this tool. Also, important modes can be activated using a single click on a mouse button. Since clicking either of the mouse button may not be very difficult for the visually impaired, we can use this option for flexibility. Existing speech based tools offer fast writing method, higher accuracy, but they are not optimized for the people with low or no vision. Text editing is a basic way to communicate with the computer. Providing a clear and efficient solution regarding this matter will obviously open a new door for the disabled which is in this case visual impairment. Five participants evaluated the system and the feedback was more than satisfactory.

Paper ID : 157 An Efficient Method for Video Summarization using Moving Object Information

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ABSTRACT:

Video surveillance system captures continuous video for the purpose of security, monitoring, investigating and so on. It requires huge memory space to store as well as enormous time to retrieve important information manually from this high volume of videos. In this paper, we propose a novel video summarization scheme using moving object information by considering area of moving objects extracted from dynamic background modeling and frame-to-frame object motion. Through this scheme we rank all frames according to the importance of being key frame by combining moving object features through a fusion method so that users can select desired length of videos for summary. The experimental results show that the proposed method provides better video summary compared to the state-of-the-art method using a publicly available benchmark BL-7F video surveillance dataset.

Paper ID : 180 Fast Inter-Mode Decision Strategy for HEVC on Depth Videos

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ABSTRACT:

Multiview video employs the utilization of both texture and depth video information from different angles to create a 3D video for more realistic view of a scene. Unlike texture, depth video is a gray scale map that represents the distance between the camera and 3D points in a scene. Existing multiview video coding (MVC) techniques including 3D- High Efficiency Video Coding (HEVC) standard encode both texture and depth videos jointly by exploiting texture video information for the corresponding depth video coding (DVC) to reduce computational time as the texture and depth videos have motion similarity in representing the same scene. This strategy has two limitations: (i) more bits and computational time might be required due to the large residuals for the misalignment between depth and texture edges and (ii) switching between different views may require more times due to the increased dependency between texture and depth. In this paper, we propose an independent DVC technique using HEVC (a video coding standard for single view) so that we can improve the rate distortion (RD) performance and reduce computational time by improving switching speed. For this, we use motion features to reduce a number of motion estimation (ME) and motion compensation (MC) modes in HEVC. As we use motion feature which is the underlying criteria for selecting different modes in the standard and then we select a subset of modes which can provide almost the same RD performance. Experimental outcomes reveal a reduction of 48% encoding time of HEVC encoder with similar RD performance and better interactivity.

Paper ID : 209 A simple approach to count and track underwater fishes from videos

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ABSTRACT:
Fishes are of great importance to the ecosystem. Behavior of fishes is interesting. Counting and tracking of fishes can provide good knowledge about the behavior of fishes. Counting and behavior quantifying of fishes within a turbulence or trawl environment are challenging tasks. The traditional methods are not only inefficient but also expensive. Thus counting and tracking under water fishes from videos are emerging topic for ichthyologists. This paper addresses a simple method to count and track underwater fishes from videos. It is a hybrid of background subtraction, Hungarian algorithm, and Kalman filter. It enables tracking of fishes whose number can vary over time. Theoretical runtime of the tracking algorithm is O(n3) with problem size n. Experimental results demonstrate its effectiveness.

ICCIT 2015 Technical Session Abstracts

Technical Session 2

Technical Session: Day 1

Parallel Session B3 : Computer Network and Data Communication I

Paper ID : 51 NEDindex: A new metric for community structure in networks

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ABSTRACT:

There are several metrics (Modularity, Mutual Information, Conductance, etc.) to evaluate the strength of graph clustering in large graphs. These metrics have great significance to measure the effectiveness and they are often used to find the strongly connected clusters with respect to the whole graph. In this paper, we propose a new metric to evaluate the strength of graph clustering and also study its applications. We show that our proposed metric has great consistency which is similar to other metrics and easy to calculate. Our proposed metric also shows consistency where other metrics fail in some special cases. We demonstrate that our metric has reasonable strength while extracting strongly connected communities in both simulated (in silico) data and real data networks. We also show some comparative results of our proposed metric with other popular metric(s) for Online Social Networks (OSN) and Gene Regulatory Networks (GRN).

Paper ID : 63 Handover Management in Heterogeneous Network

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ABSTRACT:

Femtocells and picocells are becoming popular in the telecommunication industry in order to provide high data rate communication with superlative quality of service. The concept of dividing a large cell into numerous small cells isto reduce the blocking and dropping of calls in a cellular network. Integrating femtocell and macrocell will be the medium of transferring a large volume of calls from the macrocell to the femtocells by means of efficient handling. Hierarchical Cellular Networks (HCN) offer an improved utilization of the internal networks by allocating the high and low speed users to the picocell and femtocells respectively. In this paper, we present an integrated network and discuss the major issues of mobility management. We propose a Call Admission Control (CAC) scheme with optimized SINR in the femtocellular/macrocellular network which effectively handles various calls. We also propose a M/M/C Markov model for the two layers of HCN with a FIFO queue. Both of these schemes lower the call dropping probability and the differences between them are also observed. Our proposed schemes will be very valuable for the people working in this type of research and industry to implement.

Paper ID : 140 Resource Allocation for Sum-Power Minimization in Multiuser OFDM with User Rate Constraints

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ABSTRACT:

This paper studies the resource allocation optimizationproblem under user rate constraints in a single cell multiuse-rorthogonal frequency division multiplexing system. Since the optimization problem does not have a convexity structure, it is numerically very difficult to solve and the optimal solution is computationally very expensive. We propose two efficient suboptimal solutions, i) based on Lagrange dual decomposition (LDD), and ii) based on separating the subcarrier and power allocation. The former solution employs sub gradient method to optimize the dual variables. When the number of subcarriers is very large, it is shown that the solution obtained from LDD is optimal. However, because of non-convexity of the original optimization problem, the optimality is not guaranteed. The latter approach disjoints the subcarrier and power allocation. The subcarrier allocation is performed based on proportional data rate requirements, and finally optimal power allocation is performed under given subcarrier allocation. For both of the solutions, the achieved objective values are very close to the optimal solution, and have lower computational complexity.

ICCIT 2015 Technical Session Abstracts

Technical Session 2

Technical Session: Day 1

Parallel Session B4 : Computer Network and Data Communication II

Paper ID : 299 **Near Optimal Resource Allocation Algorithm for Users with Proportional Data Rate Fairness in MU-OFDM Systems**

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ABSTRACT:

We optimize the through put of a single cell multi user orthogonal frequency division multiplexing system with proportional data rate fairness requirements. The concept is to support mobile users with different levels of service. The optimization problem is a mixed binary integer nonlinear programming (MINLP) problem, which is computationally very expensive. We propose a computationally efficient near-optimal solution. The original MINLP problem is broken down to two sub problems by introducing auxiliary optimization variables and employing integer relaxation. A stochastic multi-start approach is invoked to facilitate escape from possible local minima. The simulation results show that the proposed solution exhibits very strong adherence to the desired proportional data rate fairness while achieving higher system throughput compared to the other existing solutions.

Paper ID : 305 A Construction Method and Data Migration Strategy for Hybrid Cloud Storage

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ABSTRACT:

With more and more enterprises constructed their own private cloud storage platforms, certain limitations and challenges come for small and medium enterprises. So hybrid cloud storage is imperative with public cloud as a complement. In this paper, we propose a fast and efficient method to build a hybrid cloud storage framework: base on open source software Open Stack Swift to build the private cloud storage, use Baidu Object Storage as the public cloud provider, and do a second development of Cyber duck as the cloud storage client. This framework can realize the seamless integration of private and public cloud. To tackle the data migration problem in hybrid cloud storage, we present a part-migration-part-retention self adaptive periodic migration strategy and the specific implementation of migration process is given. The strategy not only improves the utilization rate of local cloud storage, but also makes reasonable use of public cloud storage.

Paper ID : 341 Free-Space Optical Communication with BPSK Subcarrier Intensity Modulation in Presence of Atmospheric Turbulence and Pointing Error

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ABSTRACT:

An analysis has been carried out to evaluate the Signal to Noise Ratio (SNR) and average bit error rate (BER) in presence of pointing error and atmospheric turbulence. The probability density function (pdf) of atmospheric turbulence and pointing error has been combined to find out the joint effect on the BER performance on Free-Space Optical (FSO) system. The average BER is evaluated over the combined pdf of atmospheric turbulence and pointing error. The BER performance results are numerically evaluated for several values of pointing error and different link length using Binary Phase Shift Keying (BPSK) subcarrier intensity modulation. For strong turbulence power penalty is around 20dB, while for strong jitter power penalty is around 30dB at a BER of 10^{-9} and bit rate of 1 Gbps.

ICCIT 2015 Technical Session Abstracts

Technical Session 1

Technical Session 3

Parallel Session C1 : Electronics I

Paper ID : 18 Custom MPPT Design of Solar Power Switching Network for Racing Car

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ABSTRACT:

This paper approach to design and build a highly efficient solar-powered race car for Solar Jackets Racing Team, will focus on developing a system to charge the car batteries given the energy received from solar panels throughout the day. It will utilize a switching power supply circuit to handle the variable amount of input power. The circuit will include an inductor, a switch, and a diode to transfer the appropriate energy from the source (solar cells) to the load (car battery). The switch will be controlled by a microcontroller that employs maximum power point tracking (MPPT) technology to determine how much current and voltage should be sent to the batteries to produce maximum power.

Paper ID : 15 Comparison Study Of Position Sensor less Control Based Back-EMF Estimators in PMSM

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ABSTRACT:

This research approach a study with comparison of position sensor less control schemes based on back-electromotive force (back-EMF) estimation in permanent magnet synchronous motors (PMSM). The characteristics of the estimated back-EMF signals are analyzed using various mathematical models of a PMSM. The transfer functions of the estimators, based on the extended EMF model in the rotor reference frame, are derived to show their similarity. They are then used for the analysis of the effects of both the motor parameter variations and the voltage errors due to inverter non linearity on the accuracy of the back-EMF estimation. The differences between a phase-locked-loop (PLL) type estimator and a Luenberger observer type estimator, generally used for extracting rotor speed and position information from estimated back-EMF signals, are also examined. An experimental study with a 250-W interior-permanent-magnet machine has been performed to validate the analyses.

Paper ID :148 A novel approach to obtain trajectories of targets from laser scanned datasets

Feyza Galip[1], Mehmet Caputcu[1], Ruveyda Hilal Inan[1], Md. Haidar Sharif[1], Aykut Karabayir[2], Sezin Kaplan[2], Mustafa Ozuysal[2], Burak Sengoz[2], Adil Guler[3], Sahin Uyaver[4]
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ABSTRACT:

Laser scanner has several bons when compared with video camera. It does not record real world videos excepts canned points. As a result, processing of data becomes faster and easier. Over and above, it takes away the problem of private lifeconservation.Thispaperproposesanewandcompetentcomputervision based approach for detecting and tracking targets (e.g., pedestrians and vehicles) from laser scanned datasets. Laser scanned data points from each scan have been deemed as a video frame. Blobs are extracted and then computer vision techniques(e.g., Kalman filter, Hungarian algorithms, and etc.) are applied to recognize and track the kind of targets. Scanned datasets, collected from two kinds of laser scanners, were used to conduct experiments. Full trajectories of pedestrians, vehicles, and noises were resulted in three dimensional spaces. Experimental results give evidence of the efficacy of our proposed framework.

Paper ID : 365 Tunable Bandgap and Wavelength range of Zinc Blende Indium Gallium Nitride Quantum Dots

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ABSTRACT:

Indium Gallium Nitride is a material much known for its wide range of tunable band gap. This feature makes it a viable candidate for optoelectronics and photovoltaic devices. Quantum dots made out of Indium Gallium Nitride have found numerous applications. However, it is the wurtzite Indium Gallium Nitride quantum dots which have been much studied. But recent advancements show that zinc blende Indium Gallium Nitride structure can also be utilized for multipurpose devices.This work has focused on finding the tunable band gap and wavelength of zinc blende Indium Gallium Nitride quantum dots to evaluate its possibility of being used in optoelectronics and photovoltaics.

ICCIT 2015 Technical Session Abstracts

Technical Session 3

Technical Session: Day 1

Parallel Session C2 : Computer Network and Data Communication III

Paper ID : 165 Analytical Evaluation of BER Performance of a Power Line Communication System Using Symmetrical Alpha Stable (SαS) Impulsive Noise Model

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ABSTRACT:

An Analytical approach is presented to evaluate the effect of impulsive noise on the bit error rate performance of a OFDM power line communication system in the presence of background non-white Gaussian noise. The symmetric alpha stable (SαS) model of impulsive noise is considered to evaluate the BER. The results are evaluated numerically for several power line noise bandwidth and background Gaussian noise to impulsive noise ratio. The results show that there is significant deterioration of BER performance due to impulsive noise and system suffers penalty in receiver sensitivity which is about 50dB, 45dB, 39dB and 35dB for the ratio of Gaussian noise to impulsive noise variance, Γ= 0.1, 0.05, 0.025 and 0.01respectively at a skewness and heaviness of the tails of the density function, α = 0.1. The analytical results are found to be in good agreement with simulation results reported earlier.

Paper ID : 348 PMD Monitoring of Polarization Division Multiplex Transmission System Using RF Tone Harmonics

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ABSTRACT:

We propose and demonstrate a novel technique for monitoring the first order polarization-mode-dispersion (PMD)effects on polarization division multiplex (PDM) quadrature phase shift keying (QPSK) signals. This technique uses the radiofrequency (RF) tone at first harmonic and at half the data rate(half tone) of the detected electric spectrum. The electric spectrum is generated in a tap-line using square detection. The RF tones are sually absent after coherent detection of the PDMQPSK signals. The technique uses fiber Brag grating (FBG) optical notch filter in the tap-line to remove one of the sidebands of the optical spectrum, and thus preventing the beating the sideband terms which normally cancels the RF clock tones. We focus on monitoring the effect of PMD on the regenerated RFt ones by comparing their relative amplitude slopes. The simulated technique is simple and do not require modification atthe transmitter end. It is shown that for PDM-QPSK data, the monitoring window is increased covering the whole bit period with improved accuracy.

Paper ID : 377 A Wideband Stacked Patch-Ring Antenna with Corner Perturbations for Circular Polarization

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ABSTRACT:

This paper presents a method of wide band circular polarization (CP) generation using a stacked patch-ring micro strip antenna with a single probe feed. An enhanced axial ratio (AR) bandwidth is obtained when a combination of a square ring and a square patch with negative perturbations is used as parasitic and driven elements, respectively. The axial ratio bandwidth obtained is significantly larger compared to the case when square rings are used as parasitic and driven rings with a single feed. A simulated impedance bandwidth (S11< -10dB) of16%, 3dB AR bandwidth of 8%and a peak gain of 8.65dBic are obtained from this antenna.

ICCIT 2015 Technical Session Abstracts

Technical Session 3

Technical Session: Day 1

Parallel Session C3 : Electronics II

Paper ID : 78 Proposal of a Simple Structure Photonic Crystal Fiber for Lower Indexed Chemical Sensing

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ABSTRACT:

In this paper, a simple two layer photonic crystal fiber has been proposed. The proposed PCF shows higher sensitivity as a chemical sensor for lower refractive index chemicals Ethanol and Methanol. The proposed structure also reduces confinement loss. Micro structured array of elliptical air holes in the core has been used for better sensitivity. A full vectorial finite element method (FEM) was used for the investigation of the proposed chemical sensor for its different geometrical properties. The investigation depicts the impact of various geometrical properties like inner and outer layer diameters and pitch values on sensitivity and diameters and pitch values on sensitivity and confinement loss. The simplicity and the higher results of the proposed PCF have been used for lower refractive index chemical sensor. The proposed PCF shows a higher sensitivity 40.32% for Ethanol and34.90% for Methanol at the wavelength 1.33 μm. Besides that, the proposed two layers PCF sense the chemicals in a wide range of wavelength from 0.5 μm to 1.5 μm.

Paper ID: 103 Crystal orientation dependent performance of cubic InGaN QW blue-violet laser

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ABSTRACT:

In this paper, the crystal orientation-dependent electronic and optical performance of a compressively strained quantum well (QW) blue-violet Vertical Cavity Surface Emitting Laser (VCSEL) is numerically simulated using MATLAB. It is found that there is a strong correlation between the crystal orientation and the energy band dispersion and hence the optical emission spectrum of the laser. The peak gain and peak emission wavelength depend on the orientation-dependent fundamental energy gap, energy separation between the HH1 and LH1 sub bands, and momentum matrix element. It is observed that the maximum and minimum gain of the VCSEL is 1150 and 920 cm-1 corresponding to the (112) and (110) crystal orientations, respectively, and also the peak emission wavelength can be shifted from 454 nm to 462 nm with the change in crystal orientation from (001) to (110).

Paper ID : 306 Phonon Spectrum and Group velocity calculation of Cubic Semiconductor Quantum Dot

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ABSTRACT:

Phonons play an important role in determining the electrical and thermal properties of semiconductors and other material systems. A mathematical model based on elastic continuum approach has been used for calculating the phonon dispersion of semiconductor cubic quantum dot. With this model acoustic phonon dispersions of an individual GaAs quantum dot are calculated for three different sizes to investigate the size effect on phonon spectra. Phonon group velocity has also been calculated for each phonon branch by numerical differentiation.

ICCIT 2015 Technical Session Abstracts

Technical Session 3

Technical Session: Day 1

Parallel Session C4 : System Security and Cloud Computing

Paper ID : 38 Trust Based D2D Communications for Accessing Services in Internet of Things

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ABSTRACT:

Internet of Things (IoT) is a vision of connecting everything for providing better services efficiently. IoT consists of enormous number of heterogeneous computing devices with different capabilities to provide a diverse range of services situated around the globe. Increasing number of IoT devices and availability of different services in the edge of the networks makes it inevitable to interact among devices. As a result, this open, non-homogeneous and distributed environment also breaches the integrity of secure and reliable device to device (D2D) communication. Traditional access control mechanisms are not prolific to the itinerant, decentralized and dynamic scenarios in the IoT. Trust management is a proven technology for applications like P2P, Grid, and ad hoc network. Hence, this technology can also be used to increase the user reliability in IoT. In this paper, we propose a trust based D2D communication mechanism for accessing different services to meet the growing transactions and successful operations of IoT. We also analyze the effect of adaptive trust parameters for IoT device to device communication in order to access the services.

Paper ID : 70 Secure Outage Performance Analysis for Multicasting with Linear Equalization

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ABSTRACT:

We consider a confidential communication through Rayleigh fading channel in which a source transmits a common stream of information to the multiple client receivers via multiple relays in the presence of an eavesdropper. We assume that there is no direct path from source to client receivers and eavesdropper, and communication occurs only through the relays. In order to increase the spectral efficiency, we consider a linear equalization, e.g., zero-forcing (ZF) in cooperative spatial multiplexing system. Considering the effect of linear equalization, at first, we derive the exact closed-form expression for the ergodic secrecy multicast capacity. Then, we derive the closed-form expressions for the secure outage probability and the complementary cumulative distribution function (CCDF) of secrecy multicast capacity to analyze the outage performance of proposed model.

Paper ID : 123 An Improved Bug Localization using Structured Information Retrieval and Version History

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ABSTRACT:

Locating buggy files is a time consuming and challenging task because defects can deflate from a large variety of sources. So, researchers proposed several automated bug localization techniques where the accuracy can be improved. In this paper, an information retrieval based bug localization technique has been proposed, where buggy files are identified by measuring the similarity between bug report and source code. Besides this, source code structure and frequently changed files are also incorporated to produce a better rank for buggy files. To evaluate the proposed approach, a large-scale experiment on three open source projects, namely SWT, ZXing and Guava has been conducted. The result shows that the proposed approach improves 7% in terms of Mean Reciprocal Rank (MRR) and about 8% for Mean Average Precision (MAP) compared to existing techniques.

Paper ID : 315 Securely Outsourcing Large Scale Eigen Value Problem to Public Cloud

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ABSTRACT:

Cloud computing enables clients with limited computational power to economically outsource their large scale computations to a public cloud with huge computational power. Cloud has the massive storage, computational power and software which can be used by clients for reducing their computational overhead and storage limitation. But in case of outsourcing, privacy of client's confidential data must be maintained. We have designed a protocol for outsourcing large scale Eigen value problem to a malicious cloud which provides input/output data security, result verifiability and client's efficiency. As the direct computation method to find all eigenvectors is computationally expensive for large dimensionality, we have used power iterative method for finding the largest Eigen value and the corresponding Eigen vector of a matrix. For protecting the privacy, some transformations are applied to the input matrix to get encrypted matrix which is sent to the cloud and then decrypting the result that is returned from the cloud for getting the correct solution of Eigen value problem. We have also proposed result verification mechanism for detecting robust cheating and provided theoretical analysis and experimental result that describes high-efficiency, correctness, security and robust cheating resistance of the proposed protocol.

ICCIT 2015 Technical Session Abstracts

Technical Session 4

Technical Session: Day 1

Parallel Session D1 : Image Processing and Computer Vision I

Paper ID : 142 Clustering and Detection of Good and Bad Rail Line Anchors from Images

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ABSTRACT:

Absence of railway anchors/fasteners is a serious concern as it might lead to severe consequences such as train derailments. Hence regular inspection is an obligation to ensure safety. The third world countries choose the inspection process to be non-automatic where a trained operator moves along the rail line boarding a motor trolley checking for visual anomalies. In the previous research [1], an automatic system was proposed to overcome the cons of the running manual technique by using image processing. Two feature detection algorithms - Shi Tomasi and Harris Stephen - were used and an accuracy of 83.55% was achieved. This research presents an upgraded version of the previous work by introducing Neural Network. The addition of NN has not only speeded up the detection process but increased the accuracy significantly to approximately 93.86%.

Paper ID : 159 Watermarking Approach of Embedding Patient Facial Information into RONI of Brain CT scan Image

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ABSTRACT:

This paper presents a watermarking approach which has been proposed for embedding patient facial information into region of non-information (RONI) part of Brain CT (computed tomography) scan image for image authentication and integrity verification. As the doctors diagnose from region of information (ROI), modification of even one bit is not tolerated in ROI. Therefore, the integrity of ROI must be strictly controlled. In the proposed approach, the information of ROI has been embedded into patient face image, which has been embedded into RONI of Brain CT scan image for authentication. The proposed method is based on two level discrete wavelet transform (DWT). Two dimensional Arnold's cat map and encoding technique have been used in proposed scheme to scramble and encode the patient face image before embedding. The scrambled and encoded patient face image with information of ROI has been embedded into the coefficients of RONI of Brain CT scan image by technically using additive algorithm. As the facial information has been technically embedded using additive algorithm, no original document is required in extraction stage except secret key, which means the proposed approach focused on blind watermarking. Experimental results obtained from proposed method have been compared with other existing methods by using several performance parameters including mean square error, peak signal to noise ratio and structural similarity index. From experimental results, it can be seen that the proposed method outperforms the other methods by confirming good quality of watermarked image.

Paper ID :297 Towards Real-time 3D Geometric Nonlinear Diffusion Filter and Its Application to CT and MR Imaging

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ABSTRACT:

Abstract—We propose two near real-time nonlinear an isotropic diffusion filtering (NADF) methods for the 2D and 3D X-ray computed tomography (CT) and magnetic resonance (MR) image de noising. Typically, NADFs are preferred for the medical image de noising due to its edge preserving feature though they are computationally expensive. Recently, a computation-time efficient 2D NADF has been proposed which uses local pixel intensity based geometric parameters for diffusion. But it has limitations resulting from (i) its assumption that the neighboring pixels are non-noisy while deciding on an interrogated pixel being noisy or not, and (ii) its confinement of working only on a 2D image. Motivated from this, we propose an improved 2D NADF method that uses additional neighboring pixels in an effective way to lower the noise impact on the estimated geometric parameters. We also extend our 2D method into 3D that considers all the three directions for information diffusion. The performance of the proposed methods is evaluated using a 3D synthetic phantom, and in vivo CT and MR data which demonstrates an average signal-to-noise-ratio-gain improvement of approximately 58% in 2D and 96% in 3D phantom data, and approximately 79% in 2D and 127% in 3D in vivo data, compared to the state-of-the-art method.

ICCIT 2015 Technical Session Abstracts

Technical Session 4

Technical Session: Day 1

Parallel Session D2 : Wireless Communication I

Paper ID : 47 **On the Downlink SINR and Outage Probability of Stochastic Geometry Based LTE Cellular Networks with Multi-Class Services**

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ABSTRACT:

Due to the increasing number of irregularly spaced base stations (BSs) as well as the intrinsic random channel environment, modeling and analysis of cellular networks using classical hexagonal cell shapes is becoming ever more impractical. Therefore, stochastic geometry models having the ability to picture near realistic situations is gaining a wide acceptability for evaluating cellular network performance. In light of this, this paper presents a simulation-based investigation on the downlink signal-to-interference-noise-ratio (SINR) and the outage probability of orthogonal frequency division multiple access (OFDMA)-based long term evolution (LTE) cellular systems using stochastic geometry with multi-class services. Locations of BSs are modeled using both Poisson point process (PPP) as well as hard-core Poisson process (HCPP). Moreover, a computationally efficient method is proposed for capturing the effect of inter-cell interference in such stochastic geometry based cellular networks. Network performance including the outage probability of various multi-class services under varying shadow fading scenario and BS density is evaluated using Monte Carlo simulations, and compared with that of the traditional hexagonal models. Simulation results clearly demonstrates the over optimistic network performance of hexagonal model, while the most realistic HCPP model provides a compromise between the hexagonal and the PPP models.

Paper ID : 71 Extremely Randomized Trees for Wi-Fi Fingerprint-based Indoor Positioning

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ABSTRACT:

Wi-Fi fingerprint-based position estimation becomes one of the key component of many location based services since the existing Wi-Fi infrastructures in indoor environment can be utilized for user's position estimation in order to reduce the deployment cost. However, the low positioning accuracy is still a key challenge for indoor positioning system due to the environmental dynamics and noisy characteristics of the RF signal. This paper presents a robust indoor localization approach based on Wi-Fi fingerprints using extremely randomized trees as the location estimation algorithm. In this approach, the collected raw fingerprints data are preprocessed, and then fed to the proposed localization algorithm, given their capability to handle high dimensional and unbalanced data, to localize users. The evaluation results of the experiments conducted on the first publicly available multi-building multi-floor indoor localization database indicate that the proposed technique performs much better than the traditional systems in terms of localization accuracy and calibration effort. The proposed approach yielded the maximum localization rate of 91.44%.

Paper ID : 130 Self Organized Sensor Deployment with Brownian Motion in Wireless Sensor and Robot Networks

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ABSTRACT:

In this paper, we propose a novel self organized sensor deployment protocol to ensure proper surveillance through better coverage in urban search and rescue (USAR) operations using customized Brownian motion scheme. Specifically, we use density control over Brownian Motion (DCBM) to make an adaptive self deployment protocol which can be used on heterogeneous wireless sensor and robot networks. Generally, Brownian Motion scatters particles in a random manner with disjoint behaviour which is not appropriate to be used as a mobility model for wireless network. Additionally, the model has higher collision rate among the moving particles. To avoid the previous two issues, every node in the network computes node density and decides particular direction at any timestamp. The nodes may take pause in their movement and start over from that location instead of starting every time from the initial starting point to make the model behave continuously. We simulated DCBM scheme on a series of different topologies and compared with Random waypoint model that shows promising insights.

Paper ID : 158 Performance Analysis of a Multi-antenna Based Cooperative Relaying Scheme over Fading Channels in Spectrum Sharing Environment

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ABSTRACT:

This paper presents an outage analysis of a cooperative relaying scheme over flat Rayleigh and Nakagami-m fading channels. In the proposed scheme, secondary transmitters cooperatively relay the primary traffic. Each secondary transmitter, equipped with multiple antennas, is divided into one of the two clusters: a cooperative cluster (CC) and a non-cooperative cluster (NCC). Cluster head (CH) of the CC will be selected as a best decode-and-forward (DF) relay and will forward the primary information. Results show that the proposed scheme outperforms both non-cooperative, conventional single-antenna systems and random relay selection schemes in terms of outage probability. In each case, theoretical results are verified with Monte-Carlo simulation results.

ICCIT 2015 Technical Session Abstracts

Technical Session 4

Technical Session: Day 1

Parallel Session D3 : Software Engineering I

Paper ID : 49 **Better User Recommendations using Enhancing Software Development Process Repository**

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ABSTRACT:

Reusing previously completed software repository to enhance the development process is a common phenomenon. If developers get suggestions from the existing projects they might be benefited a lot what they eventually expect while coding. The strategies available in this field have been rapidly changing day by day. There are a number of efforts that have been focusing on mining process and constructing repository. Some of them have emphasized on the web based code searching while others have integrated web based code searching in their customized tool. But web based approaches have inefficiency especially in building repository on which they apply mining technologies. To search the code snippets in response to the user query we need an enriched repository with a better representation and abstraction. To ensure that repository before mining process we have developed a concept based on Enhancing Software Development Process (ESDP). In ESDP approach multiple sources of codes from both online and offline storages are considered to construct the central repository with XML representation and applied mining techniques in the client side. The respective evaluation shows that ESDP approach works much better in response time and performance than many other existing approaches available today.

Paper ID : 116 SAL: An Effective Method for Software Defect Prediction

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ABSTRACT:

For software quality assurance, software defect prediction (SDP) has drawn a great deal of attention in recent years. Its goal is to reduce verification cost, time and effort by predicting the defective modules efficiently. In SDP, proper attribute selection plays a significant role. However, selection of proper attributes and their representation in an efficient way are very challenging due to the lacking of standard set of attributes. To address these issues, we introduce Selection of Attribute with Log filtering (SAL) to select a proper set of attributes. Our proposed attribute selection process can effectively select the best set of attributes, which are relevant for the discrimination of defected and non-defected software modules. Further, we adopt log filtering to pre-process the input data. We have evaluated the proposed attribute selection method using several widely used publicly available datasets. The simulation results demonstrate that our method is more effective to improve the accuracy of SDP than the existing state-of-the-art methods.

Paper ID : 195 FP-ANK: An Improvised Intrusion Detection System with Hybridization of Neural Newtork and K-Means Clustering over Feature Selection by PCA

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ABSTRACT:

Intrusion Detection System (IDS) predominantly works for detecting malicious attacks. Many researchers have proposed the IDS with different techniques to achieve the best accuracy with the consolidation of Clustering and Artificial Neural Network (ANN). Clustering and ANN based models give better precision rate with better accuracy where attack records are low. Nevertheless, all the features of dataset are not relevant for classifying different attacks. So, feature selection can improve the stability and accuracy of IDS. In this paper, it is proposed that IDS with the amalgamation of best efficient features selected by Principal Component Analysis (PCA) can reduce the computational complexity of the system. It has been combined with the K-means clustering technique to cluster the specific groups of attacks and Artificial Neural Network to get a preeminent output by training the formulation of different base models. The model name has been defined by FP-ANK model. Investigational results have been reported on the NSL-KDD dataset where the accuracy rate associating with other models is distinct to validate the proposed system.

ICCIT 2015 Technical Session Abstracts

Technical Session 4

Technical Session: Day 1

Parallel Session D4 : Knowledge and Data Engineering

Paper ID : 20 Map Matching for Error Prone GPS data on a Sparse Road Network and Predicting Travel Time of a Route

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ABSTRACT:

Optimal ambulance route detection in an urban area is a challenging problem especially in the presence of difficulties such as sparse road network, error-prone GPS data and irregular traffic conditions. We have worked on solutions robust to these challenges and for the first time ever in the context of Dhaka, Bangladesh. This paper presents our newly designed map-matching algorithms as well as an intelligent route prediction scheme. We have implemented our algorithms on real traffic data and discuss the results here.

Paper ID : 73 Clustered and Smarter Web mining using Semantic Web

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ABSTRACT:

Semantic Web which is an extension to the current web 2.0 presents information more magnificently for humans and automated tools as well. It offers an intelligent web service that synchronizes and arranges precised data over web in a well organized modus. The exactitude of fetching relevant data as per the user demand has been a real challenge for traditional web over years in the field of data mining. In this paper, we propose an approach for mapping data over web 3.0 through web ontology and retrieve the precised information through an intelligent agent. The agent provides all the searched data related to the user query from where desired information is found. If the user does not have enough search parameter, mining can be carried out by the information appended by the agent. Our proposed model shortlists the results fetched by traditional search engines such as Google which are semantically related tousers' search parameter. A case study of Institutions of Barisal Division is considered to examine the helpfulness of the model.

Paper ID : 270 Spatial Data Visualization Methodologies in ICT4D Research

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ABSTRACT:

This paper attempts to visualize spatial data to promote information and communication technologies in developing countries. Mass people of developing countries are not well educated. They do not have proper knowledge of data and their representation. Consequently, Government is not capable of successfully making the data available for common people. Various types of data for example, climate, agriculture, transportation are publicly available to obtain meaningful pattern from the data so that they can be utilized in efficient ways. In this research, we have reported some visualization techniques to get better understanding of spatial data. Rainfall data has been used as test data. Our research shows that, utilizing programming tools, interesting visuals can be generated to promoted information and communication technology research.

Paper ID : 354 Friend Recommendation Framework for Social Networking Sites using User's Online Behavior

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ABSTRACT:

Social network sites (SNS's) have connected millions of users creating the social revolution. Users' social behavior influences them to connect with others with same mentality. Social networks are constituted because of its user or organizations common interest in some social emerging issues. The popular social networking sites are Facebook, Twitter, MySpace, Orkut, LinkedIn, Google plus etc. which are actually online social networking (OSN) sites. However, the large amount of online users and their diverse and dynamic interests possess great challenges to support recommendation of friends on SNS's for each of the users. In this paper, we proposed a novel friend recommendation framework (FRF) based on the behavior of users on particular SNS's. The proposed method is consisted of the following stages: measuring the frequency of the activities done by the users and updating the dataset according to the activities, applying FP-Growth algorithm to classify the user behavior with some criteria, then apply multilayer thresholding for friend recommendation. The proposed framework shows good accuracy for social graphs used as model dataset.

ICCIT 2015 Technical Session Abstracts

Technical Session 5

Technical Session: Day 2

Parallel Session E1 : Information System and HCI

Paper ID : 87 Reliability Analysis of Automated Pond Oxygen Management System

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ABSTRACT:

Dependability of safety-critical systems are a prime concern of the modern society due to the growing dependence on those systems. Safety of systems is a fundamental requirement for system reliability. Fault tree analysis (FTA) is powerful, well-established, and widely used tool for evaluating system safety. Fault trees provide a graphical and logical framework for analysing the dependability of systems. They have been successfully employed in studying the failure behaviour of a variety of real-world systems. In aquaculture, the volume of oxygen contained in water is considered as a critical parameter for the health and well-being of fishes. If oxygen levels drop below 4 mg/L then fishes may stop feeding, stressed and begin to die. Automated Pond Oxygen Management System (APOMS) is a critical component in aquaculture to maintain the proper oxygen level in water. In summer months, when oxygen level starts dropping due to increased temperature, then the APOMS can balance the oxygen level in water by generating oxygen artificially. Therefore, the failure of this system may result in a disastrous outcome. In this paper, we have used fault tree analysis to evaluate the reliability of an automated fault tolerant pond oxygen management system.

Paper ID : 102 A conceptual framework for design of mobile governance in developing countries: the case of Bangladesh

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ABSTRACT:

Mobile governance (m-governance), which is considered as an extension of electronic governance (e-governance), has enormous opportunity to flourish in the developing countries due to the rapid increase of mobile phone subscribers. There are also a number of challenges accompanying the opportunities for design and implementation of mobile governance in developing countries. In this paper a conceptual framework is proposed based on secondary research to justify the current mobile governance situation of developing countries, with Bangladesh being selected as the case study, by explaining the essential components of a mobile governance system and the surrounding environmental factors that have influence upon it.

Paper ID : 163 Regulatory Requirements Compliance in E-Government Service Development

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ABSTRACT:

Electronic Government has been gathering momentum in research and practices since last decade. It is the contribution and benefit of ICTs to improve the government services to citizen and business organizations through the efficient intra-government operations. However, the introduction of e-Government services have become challenging nowadays because of the growing number of policies and regulations that needs to be compliant in the e-Government system development. The non-compliance of the regulatory requirements from policy and regulation may cause a significant consequence in the e-Government project development. This paper investigates and analyzes various concepts of e-Government regulatory requirements compliance from published literatures employing Systematic Literature Review (SLR). The results and analysis of this paper can serve the e-Government researchers and practitioners as a means of better understanding the ambiguous issues of regulatory requirements in e-Government system development to be compliant with the enacted policies and regulations.

Paper ID : 287 Exploring the Intuitiveness of Iconic, Textual and Icon with Texts Signs for Designing User-Intuitive Web Interfaces

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ABSTRACT:

Web interface signs such as navigation links, command buttons, thumbnails, small images, and icons are crucial elements of web user interfaces, which act as a communication artifact between the computer and the human (user). In other words, users interact with a web interface via interface signs. Designing intuitive interface sign become essential to make an effective human-computer interaction (HCI). But, a very limited HCI research has been focused on interface sign to design them intuitive for end users. In this paper, an extensive empirical user study was carried out through semi-structured interviews. The study found a set of underlying features for HCI practitioners to design intuitive interface signs in order to construct web interfaces intuitive for end users.

ICCIT 2015 Technical Session Abstracts

Technical Session 5

Technical Session: Day 2

Parallel Session E2 : Electronics III

Paper ID : 183 Optimization of 2x2 MZI Electro-Optic Switch and Its Application as Logic Gate

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ABSTRACT:

Electro-optic Mach-Zehnder interferometer (MZI) switches are well known devices in optical systems for their high speed of operation. In next generation optical network, such switches have wide applications due to their high switching capability and great reliability. In this paper we have investigated the enhanced performance of an electro-optic switch made by titanium diffused lithium niobate (Ti:LiNbO3) functioned as waveguide medium based on integrated Mach-Zehnder interferometer (MZI) at 1.55 μm wavelength. The performance of the switch is optimized for low switching voltage, low insertion loss, high extinction ratio. This is done by varying the strip thickness of titanium, interferometer arm length, arm gap, waveguide width, gap in the coupling region of the 3 dB couplers, and center position of second electrode deposited on integrated Mach-zehnder Interferometer arm with respect to the original axis of the switch. The designed switch gives lowest insertion loss of 0.00881dB and highest extinction ratio of 33.581 dB at 8.8 V.

Paper ID : 317 An Efficient Design of Adder/Subtractor Circuit using Quantum Dot Cellular Automata

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ABSTRACT:

In this paper, we propose an efficient adder/subtractor circuit using QCA 3-dot cell. This model is highly proficient to compute both addition and subtraction operations. We also showed here a strong subtractor circuit. Moreover, our new and novel scheme has least number of QCA cells till now. The proposed designs carry out more beneficiary than the present ones, e.g., the proposed 32-bit subtractor circuit improves 73%on QCA cell, 99%on area and the proposed32-bit adder/subtractor circuit improves 90%on QCA cell, 99%on area than the existing best known one.

Paper ID : 371 Design of High Performance and Ultra-Thin CdTe Solar Cells with SnTe BSF from Numerical Analysis

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ABSTRACT:

Polycrystalline Cadmium Telluride (CdTe) is one of the leading solar cell materials for its efficiency, cost-effective and thermal stability. In this research work, numerical analysis is done by AMPS (Analysis of Microelectronic and Photonic Structures) simulator to investigate the cell performances (Jsc, FF, Voc, efficiency and temperature stability) of ultra-thin CdTe solar cell. Reduction of absorber layer was done and observed that 1 –m absorber layer is enough for acceptable range of cell conversion efficiency in the proposed cell. The possibility of this ultra-thin CdTe absorber layer was investigated, together with 100 nm SnTe back surface field (BSF) layer to reduce the barrier height in the valence band and to minimize the recombination losses at the back contact of the CdTe PV cell. From the investigation, it was found that the proposed ultra-thin cell have conversion efficiency of 18.68% (Jsc = 21.47 mA/cm2, FF = 0.85, Voc = 1.02 V) without BSF and with 100 nm SnTe BSF conversion efficiency increased to 22.61% (Jsc = 24.27 mA/cm2, FF = 0.876, Voc = 1.06 V) with only 0.7 –m of CdTe absorber layer. Moreover, without BSF and with SnTe BSF, the normalized efficiency of the proposed cell was linearly decreased with the increasing operating temperature at the gradient of -0.18%/±C and -0.16%/±C found in this analysisrespectively, which indicated better stability of the proposed CdTe solar cell.

ICCIT 2015 Technical Session Abstracts

Technical Session 5

Technical Session: Day 2

Parallel Session E3 : Robotics

Paper ID : 222 Electrical Pole Climbing Robot For Wiring and Repairing Distribution Lines

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ABSTRACT:

The basis of this project is to create an electrical pole climbing robot which can be used to reduce the risk of an electrician to connect the distribution lines for supplying purposes. Pole climbing robot, nowadays, is a very common and interesting idea, which mainly works by connecting the distribution lines according to the directions given to it. In this modern era robots are being developed for various purposes to accomplish many tasks which seem to be too complex and life endangering for humans. Benefits of using robots have been immense in terms of risk-free, speed and efficiency of doing required tasks compared to that of humans. The main objective of this work is to to save human lives as numbers of people are died from electrical injuries almost every year in Bangladesh. Considering on that issue, a pole climbing robot has been designed, built and simulated. However, further modifications of this work might be able to perform the wiring and repairing tasks instead of an electrician. The developed robot works on the principle of linear motor, which is partially autonomous. With the installation of this project, risk of human injuries and death can be minimized while working in the distribution lines which is the main consideration of this paper.

Paper ID : 266 MAYA : A Fully Functional Rover Designed for the Mars Surface

Tanvir Ahmed Fuad*, IffaturRidwan , Md Ismail Hossain Raju, A S M Mohiuddin , Sadman Sakib Saumik, Md Mainul Hasan Polash, Promit Saha, Mohaimen Rahman, Shubhashis Roy Dipta, Md. Imtiaz Abedin, Sadiya Sayara Chowdhury Puspo, Wali Mohammad Abdullah and Md. Afzal Hossain
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ABSTRACT:

In this paper, we have discussed about the Maya- a standalone, fully functional mobile platform rover which can come to aid for human in many cases. This rover can be controlled from 1 kilometer radius. It had successfully participated in 9th Annual University Rover Challenge 2015 organized by the Mars Society and achieved 9th position among the 44 teams all over the world. In this paper we have tried to give a brief idea about Maya, its architecture, facts and features, used components and techniques used to build up the whole rover. Finally the improvements have also been reported in this paper with it's controlling system software.

Paper ID : 331 A Novel Design of a Robotic Vehicle for Rescue Operation

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ABSTRACT:

This paper describes the design and implementation of a robotic vehicle that uses a new control system based on Bluetooth communication with an Android Phone as the controller. For this project, an Arduino Microcontroller, a Bluetooth module, DC motors, motor drivers, a distance sensor, cameras, temperature and gas sensors are used. It is named a rescue robot because it can be used as a helping hand to the human rescue team by providing general information about the situation of the affected area or in mines. This robotic vehicle can also be used in other fields. The designed system is flexible enough so it can easily be upgraded or modified to be used in a variety of situations according to the need.

Paper ID : 337 Light Following & Obstacle Avoiding Robot using Autonomous & Android Based Manual Controller

Najia Manjur[1], Minhajul Arifin, Rehennuma Islam, Fariha Nusrat, Rubyeat Islam, Rownak Tabassum, Nazmul Hasan, Wali Mohammad Abdullah, Md. Afzal Hossain
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ABSTRACT:

In this work, we have presented a robot, which is compact, autonomous and fully functional. It is a proposed model which can be used in such an environment, which may be vulnerable and risky to human being. It has three types of functions. Those are light following, obstacle detection and controlling from an android device through bluetooth module. A mobile robot having a control unit integrating the processing and the main sensor functionalities into an android device is described and demonstrated in this paper.

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Technical Session 5

Technical Session: Day 2

Parallel Session E4 : Software Engineering II

Paper ID : 115 Adaptive Beamforming with a Microphone Array

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ABSTRACT:

A robust and optimized system architecture has been developed and designed for adaptive beam former with a Microphone Array. The system includes following subsystems - MMSE STSA Estimator, DOI (Direction of Interest) Estimator and an Adaptive Beam former. The system architecture has been implemented and tested for Xtensa Processor which was configured for HiFi-2 DSP Standard for audio processing.

Paper ID : 179 Forecasting US NASDAQ Stock Index Values using Hybrid Forecasting Systems

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ABSTRACT:

Capability to predict precise future stock values is the most important factor in financial market to make profit. Because of virtual trading, now a day this market has turn into one of the hot targets where any person can earn profit. Thus, predicting the correct future value of a stock has become an area of hot interest. This paper attempt to forecast NASDAQ stock index values using novel hybrid forecasting models based on widely used soft computing models and time series models. The daily historical US NASDAQ closing stock index for the periods of 08 February1971 to 24 July 2015 is used and is applied our proposed hybrid forecasting models to see whether considered forecasting models can closely forecast daily NASDAQ stock index values. Mean absolute error and root mean square error between observed and predicted NASDAQ stock index are considered as evaluation criterions. The result is compared on the basis of selected individual forecasting time series model and individual soft computing forecasting models and the proposed hybrid forecasting models. Our experimental evidences show that the proposed hybrid back-propagation artificial neural network and genetic algorithm forecasting model has outperformed as compare to other considered forecasting models for forecasting daily US NASDAQ stock index. We trust that daily US NASDAQ stock index forecasts will be notice for a number of spectators who wish to construct strategies about this index.

Paper ID : 208 Performance Analysis of an FSO Link in Presence of Pointing Error Using Multiple PIN Photodetectors with Equal Gain Combiner

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ABSTRACT:

An analysis is carried out to evaluate the conditional bit error rate conditioned on a given value of pointing error for a Free Space Optical (FSO) link with multiple PIN photo detector receivers using Equal Gain Combining (EGC). The probability density function (pdf) of output signal to noise ratio (SNR) with receive diversity is also derived in presence of pointing error using EGC. The average BER of a SIMO FSO link is analytically evaluated by averaging the conditional BER over the pdf of the output SNR to find out the numerical results. Number of approaches is presented to find the average BER for SIMO FSO link to evaluate the best approach. The BER performance results are evaluated for several values of pointing error with OOK modulation and direct detection. The numerical evaluation show that, the SIMO FSO system suffers significant power penalty due to pointing error and can be reduced by receive diversity. The improvement of receiver sensitivity over a single receiver is about 6 dB and 9 dB when the number of photodetector is 4 and 8 respectively at a BER of 10-10. It is also noticed that, FSO system with receive diversity can tolerate higher values of pointing error at a given BER and transmit power.

Paper ID : 343 TYPEHEX Keyboard: A virtual keyboard for faster typing in Smartphone

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ABSTRACT:

We present a soft keyboard layout and a novel text entry system for smart phones. The major problem in designing a soft keyboard is to fit a large number of buttons within a very tiny touch screen area. This often leads towards user discomfort and typing mistakes. Our proposed layout, TYPEHEX keyboard, presents full text entry facilities with minimum required finger movement. This name implies our vision towards achieving faster typing speed with less error occurrence using hexagonal buttons. While comparing with soft QWERTY layout, which contains 27 buttons, our proposed keyboard has only 10 functional buttons. The main 5 buttons are given hexagonal shape. It allows us to place 7 characters in a single button (1 in the center and other 6 are placed in six remaining corners of the hexagon). During placing each letter (a-z), we considered letter-frequency data, bigrams and trigrams in order to ensure that frequently used characters, character pairs and character trios are placed as close as possible. We evaluate our design by combining the movement time model which is an application of Fitts' law with the linguistic model. The calculated word per minute (wpm) values for both index finger and thumb shows that our design approach gives improved wpm values than soft QWERTY and T9 input method.

ICCIT 2015 Technical Session Abstracts

Technical Session 6

Technical Session: Day 2

Parallel Session F1 : Ubiquitous Computing

Paper ID: 39 Study of ICU Patient Condition Alert Generation Process using D2D under LTE network

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ABSTRACT:

An ICU patient is vulnerable at any moment and requires constant monitoring and fast response from the doctors and nurses at critical moments. To do so, the doctors and nurses must know when the critical situation arises to attend the patient right on time. In this paper, we propose a heterogeneous network merged with an automated system to generate alert signal if the patient is in critical condition and pass the alert mode to the nurses and doctor for fast response from them. Another issue is to inform the patient's worried visitor/attendant waiting at the hospital by sending a report periodically with selective data stating his condition. Since D2D communication under LTE network works well in close proximity, we can deploy this technique to alert the doctor about his patient's critical condition and also to transfer the report of the ICU patient's attendants waiting outside or nearby. Simulations showed that the time required for transmitting alert signal to the doctors is only few seconds indicating critical condition of the patient. This proposal needs 4G LTE network enabled smart phones as it uses D2D communication from server point to nurse station, doctor and patient attendants. Still, employing D2D will be very cost effective as we emphasis on saving human lives in time.

Paper ID: 166 Android Assistant EyeMate for Blind and Blind Tracker

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ABSTRACT:

At present many blind assistive systems have been implemented but there is no such kind of good system to navigate a blind person and also to track the movement of a blind person and rescue him/her if he/she is lost. In this paper, we have presented a blind assistive and tracking embedded system. In this system the blind person is navigated through a spectacle interfaced with an android application. The blind person is guided through Bengali/English voice commands generated by the application according to the obstacle position. Using voice command a blind person can establish voice call to a predefined number without touching the phone just by pressing the headset button. The blind assistive application gets the latitude and longitude using GPS and then sends them to a server. The movement of the blind person is tracked through another android application that points out the current position in Google map. We took distances from several surfaces like concrete and tiles floor in our experiment where the error rate is 5%.

Paper ID: 228 A Review on Diabetes Patient Lifestyle Management Using Mobile Application

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ABSTRACT:

Diabetes is a silent-killer disease that highly demands proper patient care and sound self-management which is a major challenge for a patient. The advancement in ICT and the rapid increase of mobile phone users are showing that lifestyle management of a diabetes patient can be guided using mobile application. The objective of this review is to analyze the articles and the existing mobile apps that are currently available to support diabetes patient and based on the analysis to describe the opportunities for developing a mobile app integrating most of the common features required for the self management of a diabetic patient. The review covers journal databases for articles and online markets for mobile app. Initially we found 273 articles from the journal databases and 1004 apps from the online markets out of which 29 articles and 43 apps satisfied our selection criteria. We successfully brought out five primary and seven secondary features which can efficiently handle the self-management system. The major features include blood glucose monitor, medication, diet plan, physical activity, automated transfer of blood glucose data, SMS based notification, weight management, communication etc. No app in our review is found satisfying all the features. Since all the primary and secondary features as a whole are very essential for an effective diabetes patient lifestyle management, but not available in a single app, so there is a potential scope to develop such an app integrating all the features very efficiently.

Paper ID: 362 A Proactive Approach for Context-Aware Self-Adaptive Mobile Applications to Ensure Quality of Service

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ABSTRACT:

Mobile Applications are rapidly emerging as a convenient medium for using a variety of services. With the high penetration of smart phones in society, self-adaptation has become an essential capability required by mobile application users. In an ideal scenario, an application is required to adjust its behavior according to the current context of its use. This raises the challenge in mobile computing towards the design and development of applications that sense and react to contextual changes to provide a value-added user experience. In its general sense, context information can relate to the environment, the user, or the device status. In this paper, a framework is proposed for building context aware and adaptive mobile applications. Based on the concepts of software requirement specification and probabilistic modeling, this framework guides the modeling of adaptability at design time and supports context awareness and adaptability at runtime to tackle potential issues that can hamper Quality of Service (QoS). In the core of the approach, a probabilistic model has been derived from the software requirement model using the quantitative terms of context dependability and then, it is continuously verified against the runtime operations of a mobile application. Finally, the proposed approach has been used in a mobile application development use case to observe how proactive adaptability can be built into mobile application development to ensure QoS.

ICCIT 2015 Technical Session Abstracts

Technical Session 6

Technical Session: Day 2

Parallel Session F2 : Electronics IV

Paper ID : 76 Transient Anode Voltage Modeling of IGBT and Its Base Doping Profile Investigation

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ABSTRACT:

In many power converter applications, study of doping concentration in the carrier storage region of IGBT is considered desirable. This paper introduces an estimation technique for base doping concentration through investigation into transient anode voltage modeling of Non-punch through (NPT) Insulated Gate Bipolar Transistor (IGBT). Parabolic profile has been used for derivation of minority carrier concentration within the base. With the derived expression, an analytical model has been developed for turn-off anode voltage of IGBT in all doping profile conditions. Better agreements with the experimental results have been found compared to the previously used linear model. Finally, the implications of base doping dependence on the anode voltage are discussed, including implementation of such a doping concentration estimation technique.

Paper ID: 232 Performance Analysis of Dispersion and Nonlinear Characteristics of a Photonic Crystal Fiber (PCF) with GeO_2 Core and Defected Cladding

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ABSTRACT:

An innovative Nearly Zero Dispersion Fiber (NZDF) at 1.6μm wavelength is designed having GeO_2 elliptical core, GeO_2 doped SiO_2 at gladding region as well as varying diameter of nearest air hole of core with the others air-hole and investigated Finite Element Method (FEM) using COMSOL. The suggested PCF shows encouraging dispersion characteristics (-1.954×10^{-14} ps/km-nm) with an effective area (2.11×10^{-11} μm^2) and a value of non-linear parameter (0.000641W^{-1}km^{-1}) at 1.6 μm making it suitable candidate for nonlinear optical application and chromatic dispersion controller.

Paper ID: 373 Dielectric Gratings for Efficient Light Trapping in Thin-Film Silicon Solar Cell

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ABSTRACT:

Efficient light trapping structure is needed for thin film silicon solar cell. We have investigated that dielectric diffraction grating structures have the potential to increase the efficiency by excellent light absorption. In order to boost up the efficiency of the solar cell optimized diffraction grating is designed which cause the optical path length enhancement within the silicon (Si) absorber layer. In our simulation Si square grating and titanium oxide (TiO_2) pyramid grating is integrated seperately on the illuminated surface of a 3.0 μm - thick —solar cell. Numerical simulation is performed with Finite Difference Time Domain (FDTD) method over a wavelength range of 400 - 1100 nm. The resultant potential short circuit current density is compared with the planar and ideal Lambertian case. Solar cell with TiO_2 pyramid diffraction grating on the front surface results better light trapping than the cell with Si square grating. Simulation result shows that TiO_2 pyramid grating provides a short circuit current density, Jsc, of 24.7mAcm^{-2} which is 67.2% of ideal Lambertian case.

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Technical Session 6

Technical Session: Day 2

Parallel Session F3 : Digital Signal Processing

Paper ID : 40 Cough Detection using Speech Analysis

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ABSTRACT:

Common cold is a common disease now-a-days. Due to common cold patient faces cough, sore throat, sneezing and runny nose problem. Most of the time patients' speech sounds different due to cough. In this paper, analyzing speech recording of cough and normal state of a person, we have derived two sets of representative features. These features are used for classifying normal and cough state of the patient. The classification algorithms we have used are Support Vector Machine, Bayesian Classifier and Neural Network. On the generated real life dataset, we have applied the features and classifiers. We have listed the performance statistics of the exhaustive experiment. The performance measures reveal that the classifiers with the second feature set provide very good accuracy (greater than 70% for all the classifiers). Among the three classifiers Bayesian provides the best accuracy (86.31%).

Paper ID : 220 An Efficient and Blind Audio Watermarking Technique in DCT Domain

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ABSTRACT:

A blind audio watermarking algorithm in Discrete Cosine Transform domain using the relationship among the consecutive groups of samples is proposed in this work. Here, we divided the DCT represented audio signal into equal-sized non-overlapping segments which in turn divided into four non-overlapping consecutive frames. Here, an informative relation between the frames in a segment is maintained to indicate the successful embedding of a watermark i.e. in case of embedding '1' in a segment, make the value of the 'difference between the first two frames' higher than the value of the 'difference between the last two frames' at a distance of threshold value and we do the opposite if the watermark bit is '0'. Embedding a single watermark bit in multiple segments makes the scheme robust. In this work, the size of frame and the segment entirely depend on the number of watermark bit which helps the proposed scheme to increase the capacity of watermarking. Additionally, in order to maintain security against hackers a secret key permutation is proposed to apply on the watermark message. The experimental result shows that the method provides high robustness against common signal manipulation as well as high capacity without significant perceptual distortion.

Paper ID : 367 Determination of Appropriate Substrate for Microstrip Low-Pass Filter Employing Square Designed Tschebycheff Distribution

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ABSTRACT:

In modern microwave design domain, Electromagnetic Band Gap (EBG) structures which is a unique innovation in consideration of high potential and low complication in designing with microwave integrated circuits. This article inspects the relationship between Tschebycheff polynomial distribution and operating behaviour of different substrates. A number of methods, Tschebycheff polynomial distribution for designing the conventional square pattern with constant volumetric ratio and method of moments (MOM) for numerical analysis are used. To begin with, the parametric comparison has been demonstrated reviewing the selectivity, 20-dB insertion loss bandwidth (20-dB IL BW) and 10-dB return loss bandwidth (10- dB RL BW). Consequently, two substrates RT/Duroid 5880 and FR4 prevail with negligible ripple less than 0.7 dB, well impedance matching in the passband and wider, deeper stopband upto 6-7.5 GHz. Moreover, the 10-dB RL BW fluctuates very slowly while frequency shifts 2-3% from resonant frequency. Miniaturization of the circuit has been improved along with high efficiency with the help of Tschebycheff polynomial distribution.

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Technical Session 6

Technical Session: Day 2

Parallel Session F4: Image Processing and Computer Vision II

Paper ID : 200 Computer Vision Based Bengali Sign Word Recognition Using Contour Analysis

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ABSTRACT:

This paper presents a computer vision based Bengali sign words recognition system using contour analysis. Haar-like feature based cascaded classifier is used to locate the predefined hand posture (Opened Hand and followed by Closed Hand postures) from the captured image, and bounded by a rectangular box that is initialized as region of interest (ROI). The system follows this ROI, crops it and normalizes into predefined size. The system segments skin-like area based on Hue and Saturation value from the normalized image. Then the system employs morphological operations and Gaussian smoothing to remove noises, and then converts it into gray image. The system extracts contours using Canny edge detector and encodes extracted contours into Vector Contours (VC). After scaling VC into predefined size, the system generates feature space based on equalized VC, value of normalized Auto-Correlation Function (ACF) and ACF descriptors for each sign word that will be used for training and/or testing process. The system recognizes sign words based on maximum similarity between tests and predefined training contour templates using Inter-Correlation Function (ICF). The system is trained and tested using 1800 (18×10×10) contour templates separately for 18 Bengali sign words from 10 signers achieving recognition accuracy of 90.11% with computational cost of 26.063 milliseconds per frame.

Paper ID : 241 Noise Adaptive Binary Pattern for Face Image Analysis

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ABSTRACT:

This paper proposes a Noise Adaptive Binary Pattern (NABP) for facial image analysis such as face recognition, expression recognition and gender classification. NABP encodes the face microstructures using an adaptive threshold and generates more discriminative patterns than other existing local feature descriptors. Rigorous experiments on two well-known datasets, LFW and CK+, for three different aforementioned applications demonstrate the excellence of NABP as compared to the current state of the art methods.

Paper ID : 253 A Belief Rule Based Expert System to Assess Lung Cancer under Uncertainty

Mohammad Shahadat Hossain[1], Muhammad Asif Hasan[2], Mejbah Uddin[3], Md. Monirul Islam[4] and Rashed Mustafa[5]

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ABSTRACT:

Lung Cancer which is also known as carcinoma of the lung or pulmonary carcinoma is one kind of fatal lung tumor described by uncontrolled cell growth in the lung tissues. If this tumor left untreated this growth will be spread beyond the lung in the process of metastasis into the nearby tissues or any other parts or organs of the body. Worldwide Lung Cancer is considered as one of the most leading cause of cancer related death in the present time. So, the assessment of lung cancer is a crucial issue. Lung cancer is generally assessed from its signs, symptoms and risk factors by the physicians. However, assessing lung cancer is complex due to the presence of various types of uncertainties such as vagueness, ignorance, imprecision, incompleteness associated with these signs, symptoms and risk factors. The recently developed generic belief rule-based inference methodology by using the evidential reasoning approach (RIMER) has been considered to develop an expert system to assess this disease. The system can deal with various types of uncertainties found in the clinical signs, symptoms and risk factors. The knowledge base of this system has been constructed by taking account of the real patient data as well as with the consultation of the specialists. The practical case studies are provided to test this system. It has been observed that the proposed system is more reliable than from manual system as well as than from fuzzy rule based expert system.

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Technical Session 7

Technical Session: Day 2

Parallel Session G1: Algorithms II

Paper ID : 33 Cohesion Based Personalized Community Recommendation System

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ABSTRACT:

The importance of social networking sites (SNS) in our life is increasing day by day as they are attracting millions of users by their interesting features and activities. Joining different communities is one of the most common activities of users in social network. However, information overloading has troubled many users as thousands of communities are being created each day. To solve this problem, we have introduced a cohesion based community recommendation system where cohesion means high degree of connection among SNS users. Our proposed framework consists of the steps like, extracting sub-network (e.g. Facebook), measuring the friendship factors (both offline and online), measuring user preference factor, calculating threshold from present communities of any user, and finally recommending community based on automatically derived threshold.

Paper ID : 271 Minimizing the Interference Leakage Using A Novel IA Algorithm to Provide Perfect Alignment Solutions

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ABSTRACT:

The goal of this paper is to design a new interference alignment (IA) precoders and decoders algorithm capable of finding perfect alignment solutions which is similar to the AltMin-IA in terms of convergence speed and reliability. Finally, extended the AltMin-IA algorithm to incorporate the rank constraint in the form of a minimum eigen value condition, and a transmit power constraint, which results in a generalized eigen value problem at each step of the alternating optimization procedure. In the interference channel (IC), K transmitter receiver pairs exploit the channel state information (CSI) to jointly design their transmit strategies. Specifically here, consider orthogonal frequency division multiplexing (OFDM) transmissions, where the application of existing IA algorithms require an additional level of cooperation; time synchronization. To avoid such demand, apply the precoders and decoders at the sample level in the time domain, which allows the users to transmit asynchronously.

Paper ID : 37 An Effective Approach for Relevant Paragraph Retrieval in Question Answering Systems

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ABSTRACT:

Paragraph retrieval is a substantial task in Question Answering (QA) systems. It represents the extraction of data from a huge data collection, which have the probability to contain an answer to a question and is a significantly important intermediary step between a user of a QA system and the answers. It is barely impossible to analyse a large collection of data extensively in quick time and because of the vast nature of the background data, it is very important to narrow down the search space from where an answer can be looked for. In this paper, we address the information extraction step and present an effectively designed model for the relevant paragraph retrieval, which is efficient in terms of execution time as well. The model deals with the structure and the organization of information, performs an in-depth analysis of user's question, and presents a priority based searching capability for retrieving paragraphs according to the necessity which will be both effective and time efficient. Experiments were carried out and compared against similar systems based on the data of the document retrieval task of Text REtrieval Conference (TREC) 2005. We also tested our methodology against the data set from TREC 2007. The system performance was measured in terms of various parameters such as R-precision, Recall, and Mean Average Precision. A satisfactory result achieved by our approach establishes its competency for getting integrated into any real time QA systems.

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Technical Session 7

Technical Session: Day 2

Parallel Session G2: Bioinformatics

Paper ID :107 A new approach in pattern matching: Codon Detection in DNA and RNA using Hash Function (CDDRHF)

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ABSTRACT:

Detection of different known patterns in any newly found sequence is one of the most important works in the field of Bioinformatics. Given a specific pattern, a long string has to be searched for finding that pattern. That means pattern matching is used for checking the sequence of tokens and the match has to be exact, obviously. These patterns usually have the form of either sequences or tree structures. In DNA and RNA sequences, this type of pattern searching is often needed to detect codons (both "met" and "stop" sequences) in it. This paper presents the concept and implementation of a new algorithm "codon detection in DNA and RNA using hash function (CDDRHF)" for detection of codons in long DNA and RNA sequences, using the concepts of hash function along with meta heuristic approaches. Then the gene between "met" and "stop" codons will easily be extracted tobe used for proper alignment. This new algorithm works so fast that any DNA or RNA sequence of any length can be used to perfectly search for codons within seconds.

Paper ID : 193 Context Likelihood of Relatedness with Maximal Information Coefficient for Gene Regulatory Network Inference

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ABSTRACT:

In this study, we have investigated the recently proposed association detector method Maximal Information Coefficient (MIC) instead of Mutual Information (MI) in inferring Gene Regulatory Network (GRN). GRN plays an important role to understand the interactions and dependencies of genes indifferent conditions from gene expression data. An information theoretic GRN method first computes dependency matrix from the given gene expression dataset using an entropy estimator and then infer network using individual inference method. A number of prominent methods use MI because it is an efficient approach to detect nonlinear dependencies. But MI does not work well for continuous multivariate variables. In this paper, MIC incorporated into the prominent MI based GRN method Context Likelihood of Relatedness (CLR) and proposed CLR-MIC. To understand the effectiveness of MIC in GRN inference, SynTReN generated synthetic data and SOS E. Coli real gene expression data were considered. The experimental results revealed that proposed CLR-MIC outperformed its counter standard CLR and identified the proficiency of MIC in GRN inference.

Paper ID : 210 An Efficient REDCap Based Data Collection Platform for the Primary Immune Thrombocytopenia and Its Analysis Over the Conventional Approaches

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ABSTRACT:

Primary Immune Thrombocytopenia (ITP) is a rare chronic disease. The registry of ITP contains all the necessary information for its research and analysis. The registry is thoroughly dependent on its underneath data collection platform. Generally, data collection for the ITP conducted on a routine basis and over a long period of time. However, most of the existing web based data collection approaches compromise the data security, data backup, flexibility and scalability. The REDCap based system can overcome these weaknesses as it has easier migration, validation, extraction and evolution processes. Thus, this paper develops a REDCap based data collection platform for the ITP registry. Then a detail comparative analysis between the two systems has been presented.

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Technical Session: Day 2

Parallel Session G3: Information Systems I

Paper ID : 27 A Study on Low Cost Solar Powered Wheel Chair for Disabled People of Bangladesh

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ABSTRACT:

This paper presents a study on low cost solar powered wheelchair for disabled people of Bangladesh. The main components are: the wheelchair structure, the solar panels, the DC motors, the controlling circuits, microcontroller and joystick. The proposed model is very useful for the physically challenged people of the rural areas. This proposed model is affordable to the low income people of countries like Bangladesh. The wheel chair is cost effective and user friendly. The proposed model is self driven and independent. For the proposed model the Life Cycle Cost analysis is done and compared with the power wheel chair that takes the grid power for charging and the proposed model is proven to be lower in the cost. The solar powered wheel chair will help the physically challenged people a great deal in their day to day movements. The proposed model will be very effective in the rural areas as well as in the urban areas.

Paper ID :59 Smart Taxi Control System: Bangladesh Perspective

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ABSTRACT:

To reduce the passengers' adversity and elevate the social security, consumer rights, an effective and smart taxi control system is proposed in this paper. The system may help to reduce the different problems mass people face while travelling on a CNG driven taxi. Certitude of reasonable fare charging can be easily uphold by the proper implementation of this smart system. Forgery of driving license and fitness license of vehicle will be reduced because of the highly secured registration process of the system. Proposed system also provides the proper opportunity to the vehicle owner to monitor the owned vehicle as well as an income statement of daily income on behalf of each vehicle. Taking legal steps will become a matter of mouse clicks to Law enforcement authorities due to the enhanced tracking facilities of the system. Smartly designed meter device, indicator light and siren surely a suitable solution for socio-economic perspective of Bangladesh. Though the system is proposed for CNG driven taxies, but it can be implemented for other vehicles with little modification.

Paper ID : 199 A Wearable Sensor Based Elderly Home Care System in a Smart Environment

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ABSTRACT:

Elderly people need 24-hours care and support for their physical disability and mental weakness. With the ever growth of the elderly people this section needs some importance. But 24-hours caring and monitoring can't be provided by the family members and caregivers because of their daily affairs. So the question arises here how they gives supportive care to their elderly. The answer is related to the using technology. In every sphere of our life technology is used for making the life easier and comfortable. So the care givers monitor and care their elderly people with the help of technology. These kind of technologies introduced smart environment. The smart environment informs the care givers about the current position and status of the elderly people and their living environment. In this paper we introduced a wearable sensor based elderly home care system in a smart environment. We have used personal computers as monitoring system, sensors for sensing data, web service to communicate between monitoring systems. From our user study we can see that our system is not only useful but also would be helpful for further research in this domain.

ICCIT 2015 Technical Session Abstracts

Technical Session 7

Technical Session: Day 2

Parallel Session G4: Pattern Regognition and ANN II

Paper ID : 9 Evaluation of Different SVM Kernels for Predicting Customer Churn

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ABSTRACT:

Churn prediction has been emerging as an essential research area in the commercial sector, specially in telecommunication business. Predicting future churners and retaining them through campaigning is a crucial job in this competitive telecommunication market. Although, several classical procedures exist for predicting churn, but recently Support Vector Machines (SVMs) are gaining popularity for providing excellent out-of-sample generalization. This paper aims to evaluate various SVM kernels to predict churners on an imbalanced distribution of churners and non-churners data set. The experiment was carried out on a telecommunication data taken by random sampling. Our study shows that linear kernel outperforms commonly used Radial Basis Function (RBF), sigmoid and polynomial kernels.

Paper ID : 288 Fuzzy Membership Function Generation using DMSPSO for the Diagnosis of Heart Disease

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ABSTRACT:

Fuzzy decision support systems (FDDSs) have demonstrated their ability to solve different kinds of problems in various application domains. Currently, there is an increasing interest to generate FDDSs with learning and adaption capabilities. In this paper, DMS-PSO can be merged with FDDS for giving the learning and adaptive capability of FDDSs. Here, DMS-PSO used for optimizing membership functions to design efficient and effective fuzzy DSSs. The proposed model is works as follows: Firstly, the datasets are preprocessed so that important effective attributes are selected to handle noisy data. Secondly, fuzzy rules are learned from example(s) and the optimize membership functions of fuzzy DSSs and adapting the DMS-PSO is done. Finally, to establish the efficiency of the adaptive FDSSs the presentation of the FDDSs is evaluated with quantitative, qualitative and comparative analysis. From the experimental results outcome, adaptive FDSSs obtained better accuracy when compared to the existing systems.

Paper ID : 368 Isolated Bangla Word Recognition and Speaker Detection by Semantic Modular Time Delay Neural Network (MTDNN)

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ABSTRACT:

Speaker recognition is the identification of a person from characteristics of his/her voices and speech recognition concerns the recognizing of what is being said by the speaker. This paper presents a framework to recognize the isolated Bangla words and the corresponding speaker by proposing a semantic modular time delay neural network (MTDNN). Underlying acoustic fuzziness of human utterance and fluctuations of data due to environmental disturbance are managed by well-known Fuzzy C Means clustering technique. We have used MFCC features to recognize Bangla words and speaker detection. Experimental result with different individuals show that the proposed framework is functioning quite satisfactory with average accuracy of 82.66%.

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Technical Session 8

Technical Session: Day 2

Parallel Session H1: Wireless Communication II

Paper ID :187 Implementation of Remote Wireless Communication Laboratory for Enhancing Engineering Education in Developing Countries

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ABSTRACT:

At present a large number of skilled engineers are required in the wireless communication sector with a deeper understanding of all sorts of wireless technology both practical and theoretical. However, in most of the developing countries such as Bangladesh it is not possible to provide the latest and relevant practical experiences to each of the students due to limited resources. So an appropriate method for improving and enriching engineering education in developing countries is essential. This paper focuses on the design and implementation of web accessible remote laboratory for wireless communication to utilize limited resources for enhancing engineering student's practical knowledge as well as self learning ability. This lab allows the student to perform experiment from their home or any preferred location using the internet connection. Several analog and digital modulation based experiments have been designed for this remote wireless communication lab. Various kinds of performance analysis parameter for wireless communication system at the receiver are also analyzed. This remote laboratory system has been designed using LabVIEW application software, MATLAB, USRP, Ethernet switch and HD web camera.

Paper ID : 218 An Improved Position based Power-Aware Routing Algorithm in Mobile Ad-hoc Networks

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ABSTRACT:

In this paper we introduced an improved scheme based on a weighted metric of remaining battery power, speed and distance of nodes for determining routes in wireless Mobile Ad hoc Networks (MANET). For the cases where significant difference in the velocities of the communicating nodes or the battery power of the intermediate nodes is low, traditional schemes fail to establish the communication among nodes with reliable QoS. We proposed a new algorithm that uses weighted combination of metrics of distance, velocity and battery power in selecting the route over earlier MFR (Most Forward within Radius) method. The proposed scheme encompasses the load balancing issues and eventually it increases the network lifetime and network performance. Simulation experiment showed that the proposed algorithm reduces the packet loss than that of existing MFR algorithm. Experimental results also revealed that besides packet loss, the proposed strategy achieves higher throughput (14.35%) rate than that of existing MFR. Furthermore, usages of these new metrics ensure the higher mean time to node failure.

Paper ID : 245 An Efficient Security Architecture for Wireless Sensor Networks using Pseudo-inverse Matrix

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ABSTRACT:

Public Key Cryptography (PKC) based schemes in Wireless Sensor Networks (WSNs) are very difficult to employ due to the resource constraint characteristics of the tiny sensors. Addressing the features of sensor nodes, in this paper, we propose a PKC based architecture, where singular value decomposition (SVD) of pseudo-inverse matrix is used for the key generation. Main attention of our paper is devoted to the security level and power consumption as the Asymmetric Key-Based Architecture is usually considered incompetent in terms of cost efficacy. Our experimental results demonstrate that the proposed scheme ensures better performance in terms of security and power than other prevailing asymmetric schemes considering the MICA2DOT motes of wireless sensor nodes. In addition, it can help to realize the networks accurately, utilizing computational ability, storage and energy level of the current generation sensor nodes.

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Technical Session 8

Technical Session: Day 2

Parallel Session H2: Electronics V

Paper ID : 133 Optimized Designs of Reversible Fault Tolerant BCD adder and Fault Tolerant Reversible Carry Skip BCD Adder

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ABSTRACT:

In recent years, reversible logic has become one of the most important areas of researches because of its applications in several technologies; such as low-power CMOS, Nanocomputing and optical computing. In this paper, we have presented designs of a compact and efficient fault tolerant reversible Binary Coded Decimal (BCD) adder as well as a fault tolerant reversible Carry Skip BCD adder. We have proposed new reversible fault tolerant gates and heuristic algorithms to design compact BCD Adders. The proposed reversible fault tolerant BCD adder achieves the improvement as reducing cost of 23.07% on the number of gates, 52.67% on quantum cost, 31.03% on garbage outputs, 29.16% on the number of constant inputs and 23.07% on unit delay over the existing best one. Similarly, the proposed reversible fault tolerant carry skip BCD adder achieves the improvement as reducing cost of 34.72% on the number of gates, 43.24% on quantum cost, 37.5% on garbage outputs, 37.14% on the number of constant inputs and 34.72% on unit delay over the existing best one.

Paper ID : 136 Optimal Design of a Low Power UWB LNA for 5–10 GHz Application

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ABSTRACT:

This paper introduces low power Ultra wideband LNA designed with lower supply voltage in 130nm CMOS RF technology for 5–10 GHz band application. The effect of parasitic and nonlinear relationship among performance parameters has been considered in the design process. Considering the maximum gain, low supply voltage has been used to reduce power consumption. Two designs have been proposed to distinguish the trade off among power, noise figure and linearity. Simulated results were compared with several published results on UWB LNA at simulation level.

Paper ID : 175 Performance Limitations of a WDM Coherent Optical Transmission System due to Raman Amplifier Induced Crosstalk

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ABSTRACT:

Analysis is presented for a wavelength division multiplexing (WDM) transmission system with optical on-off-keying (OOK) modulation and heterodyne detection taking into account the effect of Raman amplifier induced crosstalk and beat noise components arising out of beating of pump power, signal power and crosstalk during the photodetection process. The results are numerically evaluated at a bit rate of 10 Gbps for several WDM channel, inter channel spacing, fiber length and local oscillator power in the receiver. The results are presented in terms of signal to crosstalk plus beat noise ratio and bit error rate (BER). It is found that BER deteriorates due to crosstalk induced by Raman amplifier at higher number of WDM channel and higher transmission distance. The allowable transmission distance for a given BER of 10^{-9} and number of WDM channel are also evaluated. For example, the allowable transmission distance is approximately 92 Km for the number of channel is 4 whereas it reduces to almost 7 Km when the number of channel is increased to 16, at a BER of 10^{-9} with pump power of 10 mW and inter channel spacing 12.5 GHz .

ICCIT 2015 Technical Session Abstracts

Technical Session 7

Technical Session: Day 2

Parallel Session H3: Information Systems II

Paper ID : 36 A Semantic-Based Technique for Question Classification in Question Answering Systems - A Hybrid Approach

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ABSTRACT:

Question classification plays a substantial role in Question Answering systems. To obtain a semantically rich and syntactically sound question classifier, we present in this paper a semantic-based hybrid approach that explores the meaning underlying the question and seeks to understand the linguistic denotation of the question by constructing a lexically minimalistic syntactic labelled graph from it. Questions are classified into one of the six major and fifty finer classes. The system proposes a training method that learns a set of graph traversal rules to detect a question's focus. A standard set containing diverse classes of benchmark questions is used for the training purpose. The system proposes using a semantic memory to store a set of commonly used and unambiguous words that often occur with specific graph traversal rules. A modified technique of the Word Sense Disambiguation using WordNet detects the contextual meaning of a question's focus and maps it to a finer class. A substantial improvement achieved using the approach over other similar systems using similar benchmark data shows that the current approach can be used as a syntactically and semantically rich model in the area of question answering systems.

Paper ID : 64 Applying the Technology Acceptance Model in examining Bangladeshi consumers' behavioral intention to use Mobile Wallet: PLS-SEM Approach

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ABSTRACT:

Mobile based cash transaction services, also known as mobile wallet was first introduced by the BRAC bank in Bangladesh. Since its inception, it has been widely accepted by unbanked people of Bangladesh. This study examines consumers' behavioral intention to use mobile wallet services in Bangladesh in terms of applying, and analyzing TAM. Total 104 respondents who were chosen randomly within the sample extent and sample frame completed the structured survey questionnaires to know the perception about the services, and the motivation to use mobile wallet. Instead of using Covariance-Based tool of Structural Equation Modeling, Partial Least Squares Structural Equation modeling (PLS-SEM) tool was employed in order to analyze data which provides evidence of there liability and validity of the Technology Acceptance Model (TAM) in this study. The result shows that all variables of the model, except perceived ease of use, significantly affect users' behavioral intention to use mobile wallet.

Paper ID : 226 Development of National Health Data Warehouse Bangladesh: Privacy Issues and a Practical Solution

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ABSTRACT:

Healthcare organizations in Bangladesh own a large amount of data in diverse health information systems. Potential and useful hidden knowledge can be discovered if integration of this huge medical data is performed in national level. The integration process requires linkage of patients' records among different heterogeneous sources. To facilitate effective data mining, it is essential to preserve record linkage in health data warehouse by retaining identifiable attributes. On the other hand, identifiable health data have high risk to patient privacy and also increase the chance of attacks by cybercriminals. In this paper, we have provided a practical solution of privacy and security problems for developing national health data warehouse of Bangladesh. Our developed technique can anonymize identifiable private data of the patients while maintaining record linkage in national warehouse to facilitate knowledge discovery process. For this purpose, we have used encrypted mobile number, gender and name-value of patients to produce Patient Identification Key. Our system is being implemented to protect privacy of sensitive health data in health data warehouse.

Paper ID : 258 Espionage: A voice guided surveillance robot with DTMF control and web based control

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ABSTRACT:

This paper proposes a research that was taken up in the wake of increasing awareness of security crisis all over the world. An effort has been made to briefly demonstrate the proof of concept of using a mobile surveillance system based on the Raspberry Pi, capable of streaming live video feed and being controlled through voice. In addition to that the robot can also be controlled through backup means should the main control system fails. Currently, the option of using a mobile phone to ring the bot and control it using the keypad via DTMF exists. Also the robot can be controlled from the internet using a web interface. The viability of the use of remote control technology in surveillance systems has been addressed in our endeavor.

ICCIT 2015 Technical Session Abstracts

Technical Session 7

Technical Session: Day 2

Parallel Session H4: IT in Bangladesh

Paper ID : 22 PoE (Power over Ethernet) switch based remote power control system for the better performance of ISPs in Bangladesh

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ABSTRACT:

There are Forty ISPs (Internet Service Provider) operate in Bangladesh which provide services like Basic Internet Connection, IP-VPN Services, MPLS, Mail Server, Intranet etc., to both Corporate & SOHO (Small Office/Home Office) users, along with individual users by various delivery method like ADSL, DSL, FTTH, Wi-Fi, WiMAX, Radio or simple Ethernet connection. To cover, vast geographic area & to provide last mile connectivity to their users, ISPs setup numerous PoPs or Point of Presence in strategic locations, equipped with required hardware and connected by backhauling of telecommunication lines or FTTH connections or Radio. Usually the strength of an ISP is measured by its number of PoPs and the number of subscribers these PoPs can handle. Nowadays PoPs are usually resided inside the rented space of telecommunication switching room or BTS (Base Transceiver Station). These PoPs are usually equipped with network equipment like Network Switch, Gateway, Router, E1 Converters, and Media Converters etc. Most of the time, these PoPs are not manned. And because these are rented, the original owners (Telecom Operators) keep those locked in. Problem arises when the mentioned equipment (E1 converter, Media Converter) becomes unresponsive, or in tech slang, gets hanged. To resolve the issue, one has to go to the remote site just to flip the power switch to perform a simple reboot of the unresponsive device. A common phenomenon in this situation is, often there aren't any technically trained personnel at the site who can perform maintenance and resets on equipment. Even if it is a manned station, the risk of wrong equipment getting rebooted is high. To encounter such problems, lower the travel time expense-time, eliminate the man-hour misused and specially minimize downtime, we developed a PoE (Power over Ethernet) switch based remote power control system by which a network administrator can control power of network equipments from anywhere and anytime. Power over Ethernet switch offers advance switching controls and provides power to network devices using Ethernet cables. These are the sole reasons which propelled the motivation to research in this particular issue. We believe this would help this competitive industry (ISP) to minimize cost and maximize service efficiency.

Paper ID : 74 Analysis of Real Time Frequency Transients and Inertia Estimation of Bangladesh Power System

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ABSTRACT:

This paper presents observations of real time frequency transients of Bangladesh Power System (BPS) including last country-wide blackout on 1st November, 2014 after HVDC station tripped with respect to frequency control and primary focus on Inertial Frequency Response. The inertia constant of a system describes the initial, transient, frequency behavior of a system when subjected to a real power disturbance. Therefore, the inertia constant of a system can be a useful tool when investigating the frequency stability of a system. The frequency transients of power system is a significant index for power system operation and research on the dynamic frequency characteristic of power system is the basis of many important design works such as the design of under frequency load shedding scheme. Therefore, it is of great urgency and necessity to analysis the dynamic frequency characteristic of BPS before countrywide blackout after disturbance. This paper first analysis two real time frequency transients those have almost similar pre- disturbance network condition and secondly shows that maintaining minimum level of Inertial reserve in real-time operations with unit commitment can be crucial to ensure stable, secure and reliable operation of BPS . Beside this under frequency scheme should be revised and controlled BPS network disintegration along with rate of change of frequency should be adopted for adaptive as well as self-healing of BPS. This paper also focus on adaptive central under frequency and under voltage load shed scheme (UFVLS) rather than discrete under frequency load shed (UFLS).

Paper ID : 135 Rain Attenuation Prediction Analysis and Contour Map Design over Bangladesh

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ABSTRACT:

Rain fall causes drastic attenuation in wireless communication signal including mobile, satellite communication etc. Consequently, there is a substantial requirement to consider rain attenuation to design system for various terrestrial links. This paper contains annual R0.01% rain rate of 30 stations for 31 years around Bangladesh. Using ITU-R prediction model, total rain attenuation is obtained utilizing different time, distance and frequency. Vertical polarization is considered to measure the attenuation due to its less attenuation than horizantal. Moreover, the contour map is designed for different bands (C, Ka and Ku band) for vertical polarization. Furthermore, from the entire contour map, it is also observed that, rain attenuation is the most severe in Teknaf and least in Rajshahi.

Paper ID : 369 Semantic Annotation of Bangla News Stream to Record History

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ABSTRACT:

Every day thousands of news articles are published in Bangla from several different sources on the web and this number is even increasing rapidly. On the contrary, the readers are often selective to read their desired news only. In this connection, classical Information Extraction (*IE*) techniques are used to query with keywords from unstructured or semi- structured news contents to fulfill partial requirements. However, they cannot interpret sequences of events, relation among entities, inference some unveiled facts to facilitate further human analysis. To achieve this goal, semantic technology adds formal structure and semantics to the news stream. In this paper, we propose a system to analyze Bangla news content to annotate especially things, people and places with semantic technology automatically by extracting *what* happened, *when, where* and *who* being involved in the news with the help of classical Natural Language Processing (*NLP*) techniques. Furthermore, we relate news of today with the previous news to accumulate information over time. We present our proposed system of annotating Bangla news semantically and experiment with *SPARQL* to inference integrated news from different sources over time and shows its effectiveness in querying specific information.

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