Title: AI-Enabled Risk Assessment and Safety Management in Construction

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Abstract: The construction industry is characterized by its complex and dynamic nature, where risk assessment and safety management play pivotal roles in ensuring project success and worker well-being. Integrating Artificial Intelligence (AI) technologies has introduced transformative possibilities for enhancing risk assessment methodologies and safety management practices in construction projects. This chapter explores the synergistic relationship between AI and construction safety, shedding light on the innovative applications, benefits, and challenges that emerge when AI is harnessed to improve risk analysis and safety protocols. Furthermore, the ethical and social considerations associated with adopting AI in construction safety are explored, underlining the importance of striking a balance between technological advancement and the human element. The potential challenges related to data privacy, algorithm transparency, and workforce upskilling are addressed, offering insights into the responsible deployment of AI-enabled safety solutions. This chapter underscores the transformative potential of AI-enabled risk assessment and safety management in construction. By leveraging cutting-edge AI technologies, construction stakeholders can revolutionize traditional safety practices, leading to enhanced project outcomes, reduced incidents, and improved overall industry sustainability.

Keywords: Artificial Intelligence in construction Construction risk assessment Safety management systems AI-enabled decision making Ethical and social implications of AI

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