

Title: AttNet: An Attention-Based BiGRU Network for Remaining Useful Life Prediction

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Abstract: Remaining Useful Life (RUL) prediction is crucial for prognostics and health management (PHM) in industrial applications, as it helps to reduce unexpected maintenance and downtime costs. This study introduces AttNet, an Attention-Based Bidirectional Gated Recurrent Unit (BiGRU) Network designed for RUL prediction that can effectively capture and prioritize key temporal features in the data, leading to more accurate RUL predictions. Our model builds upon previous works, specifically improving upon the approaches utilized deep learning models for RUL prediction on the NASA C-MAPSS turbofan engine dataset. Experimental results show that AttNet outperforms state-of-the-art achieving maximum RMSE 17.27% improvement on FD001 and 9.06% improvement on FD003. It shows the effectiveness of our AttNet in accurately predicting RUL.

Keywords: Remaining Useful Life (RUL) Prognostics and Health Management (PHM) Attention Mechanism Bidirectional GRU (BiGRU) Deep Learning

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