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Subject: Submission of Manuscript - "Prior Knowledge-Infused Self-Supervised Learning and Explainable AI for Fault Detection and Isolation in PEM Electrolyzers"

Dear Editorial Team,

I hope this letter finds you in good health. I am writing to submit our manuscript entitled "**Prior Knowledge-Infused Self-Supervised Learning and Explainable AI for Fault Detection and Isolation in PEM Electrolyzers**" for your kind consideration for publication in the Journal of Neurocomputing. All the authors have reviewed the paper diligently, and there are no conflicts among us.

Our paper presents a novel approach for fault detection and isolation in Proton Exchange Membrane (PEM) electrolyzers. This method combines Bond Graphs and Self-Supervised Learning to address the challenge of limited labeled fault data. It introduces the utilization of Linear Fractional Transformation-Bond Graph (LFT-BG) models to generate uncertain residuals and pseudo labels. BG-XAI incorporates eXplainable AI and structural equations from Bond Graphs to elucidate the decisions of a deep learning model.

A portion of the paper, particularly concerning explainable AI, was previously presented at the 2023 International Conference on Control, Automation, and Diagnosis (ICCAD) (Title: “ **FDI-X: An Occlusion-based Approach for Improving the Explainability of Deep Learning Models in Fault Detection and Isolation**”). However, we want to emphasize that the modified method presented in this submitted manuscript is methodologically distinct, and its application is demonstrated on an entirely different system. Furthermore, it extends the explanation by using structural relationships, which was not included in the previous work.

We commit to making all the data and codes related to this manuscript available if necessary. Thank you for your time and consideration. We eagerly anticipate the opportunity to contribute to the Journal of Neurocomputing and look forward to the possibility of our manuscript being published in your esteemed journal.

Sincerely,

Balyogi Mohan Dash

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