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2025 IEEE 4th International Conference on Smart Technologies for Power, Energy, and Control (STPEC 2025) : Submission (1104) has been edited. Inbox x

 **Microsoft CMT** <noreply@msr-cmt.org>
to me

Thu, Jul 31, 2:09 PM (19 hours ago) ★ 😊 ↶ ⋮

Hello,

The following submission has been edited.

Track Name: T1 - Power Systems and Smart Grids

Paper ID: 1104

Paper Title: Gramian Angular Field-Assisted Deep Learning Approach for Fault Detection and Localization in Power Distribution Systems

Abstract:
Timely and accurate detection of faults in power distribution systems is critical for maintaining grid stability and operational reliability. This paper presents an efficient deep learning framework that combines Gramian Angular Field (GAF) encoding with Convolutional Neural Networks (CNNs), including AlexNet, VGG-16, ResNet-18, and ResNet-34 – for fault detection and classification. The GAF induced CNN method transforms one-dimensional three-phase current signals into structured two dimensional GAF images, capturing temporal and inter-phase relationships in a spatial format amenable to visual learning. This enables the CNN models to effectively classify fault type, involved phase(s), and fault location across varying network topologies. The framework is evaluated on simulated datasets for IEEE-9 and IEEE-14 bus systems under diverse fault conditions, including variations in inception angle and fault resistance. Experimental results demonstrate high accuracy, F1-score, and robustness, validating the proposed GAF-CNN approach as a scalable and interpretable solution for intelligent power system fault diagnosis.

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Secondary Subject Areas: Not Entered