

Departmental Seminar

Seminar Title : Insulator Condition Classification, Defect Detection, and Segmentation using Yolov8 Deep-Learning Model
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Venue : Seminar Room (EE-205)
Date and Time : 06 Sep 2024 (5:30 PM)
Abstract : This study proposes a single-stage deep learning model capable of condition classification, defect detection, and segmentation for high-voltage insulator inspection. Leveraging the Insulator Defect Image Dataset (IDID) from the Electric Power Research Institute (EPRI), which includes three conditions (good, broken, and flashed surface), the model undergoes image pre-processing before training. Utilizing the auto-annotation feature of the Segment Anything (SAM) model, a segmentation dataset is generated using a pre-trained YOLOv8 detection model. The experimental results demonstrate exceptional performance, with the insulator condition classification model achieving 93.49% accuracy and the detection and segmentation models achieving mAP@50 of 92.9% and 82.6%, respectively. This remarkable performance enables proactive maintenance, minimizes downtime, and enhances power systems' overall security and reliability.