National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Attention Driven Reparametrized Residual Learning for Illumination Enhancement in Wireless Capsule Endoscopy.
Speaker	: Shaunak Mandal.
Supervisor	: Prof S K Dhara
Venue	: EC228, IPCV Lab
Date and Time	: 16 Jan 2025 (4.30PM)
Abstract	: Wireless Capsule Endoscopy (WCE) is a cutting edge technique used to examine the gastrointestinal tract (GI) and offers a non-invasive method to visualize and diagnose conditions deep within the digestive system. While WCE has been proven to be a highly effective solution, it still encounters several challenges, particularly related to the quality of the images that it captures. One of the main issues is low illumination, which often results in underexposed images that obscure crucial details, which makes accurate diagnosis difficult. Although researchers have acknowledged these challenges, especially in the context of low-light imaging, solutions remain underexplored. To tackle this problem, we propose the Attention Driven Reparameterized Residual Learning model, an approach that focuses specifically on the enhancement of low-illumination WCE images. Our model uses a spatial attention mechanism combined with reparameterized residual learning, enabling the extraction of both shallow and deep features from the images. This comprehensive feature extraction allows our model to generate outputs that closely resemble ground truth images and significantly improve visualization. Our method demonstrates improved PSNR and SSIM values compared to existing techniques, consistently out performing traditional approaches. This advancement offers a robust solution for WCE image quality enhancement, supporting more accurate and reliable diagnostics.