National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Effects of Novel Segmentation Framework ConvUNext Network along with Spatial Attention Module on Small Brain Tumor Dataset.
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Venue	: EC - 128, ECE Department.
Date and Time	: 27 May 2025 (11.00AM)
Abstract	: The segmentation of brain tumor images has been essential for diagnosing the tumorous region. This helps in the development of effective treatment strategies and guiding surgical decisions. Manual segmentation methods had been used earlier, which led medical practitioners, researchers, and radiologists to recognize the tumors at a very late stage, increasing the risk of mortality for the patient. The proposed segmentation framework has been trained, validated, and tested in a publicly available dataset that provides various MRI scans of glioma tumors at different stages. The proposed framework for brain tumor segmentation incorporates pre-trained ConvNeXt blocks as the backbone of the U-Net architecture, further enhanced by a Spatial Attention Module (SAM). The BraTs 2020 brain T1-weighted MRI dataset has been used to perform segmentation in the proposed framework. The framework demonstrated outstanding performance with a Dice Score Coefficient (DSC) of 93.49% using the ConvNeXt+U-Net along with a spatial attention module. The combination of the advanced feature extraction capabilities of ConvNeXt with attentionguided segmentation makes this framework outperform state-of-the-art models, offering superior segmentation accuracy. The findings highlight the potential of this approach in enhancing brain tumor segmentation for better disease understanding, diagnosis, and treatment planning.