National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Fusion of Multi-Scale CNN for Motor Imagery EEG Classification.
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Supervisor	: Prof Samit Ari.
Venue	: EC303, Seminar Room
Date and Time	: 21 Jun 2024 (04.30PM)

Abstract : Brain-computer interface (BCI) is a groundbreaking and innovative paradigm in human-computer interaction, with the potential to enhance the living standard with technological advancement. The electroencephalogram (EEG) signals associated with motor imagery (MI) have been widely employed in several BCI systems. However, the challenge of individual variability in signal patterns hinders the classifier's efficacy. This article presents a fusion multi-scale convolutional neural network (MCNN) to perform an end-to-end MI EEG classification BCI system. The proposed multi-scale CNN fusion employed spatial and depthwise filters to learn temporal and spatial MI EEG features. Multiple scales of CNN are used, since characteristics at multiple scales to develop a subject-dependent model are crucial to learn, as each individual exhibits a unique signal pattern. The evaluation for classification performance is executed using the BCI Competition IV 2a (BCIC IV 2a) dataset. Furthermore, t-SNE visualisation is shown to illustrate features extracted for a subject. Compared with some existing state-of-the-art methodologies, the proposed method demonstrates enhancements in performance metrics.