
Registration Seminar

Seminar Title	: Unmanned Aerial Vehicle Direction Control using Electroencephalography
Speaker	: Sima Das (Rollno : 522cs3006)
Supervisor	: Prof. Sambit Bakshi
Venue	: Computer Science Conference Room CS323
Date and Time	: 03 Oct 2024 (15:30)
Abstract	: In recent years, there has been a significant increase in the demand for more intuitive and accessible control systems for Unmanned Aerial Vehicles (UAVs). Traditionally, UAVs have been operated using manual control devices or pre-programmed routes using onboard computers. This research aims to explore the integration of UAVs with Electroencephalography (EEG) technology, which would enable individuals with good cognitive and neuropsychological skills to control UAVs. The motivation behind this research is to develop smarter and more intuitive control systems, allowing UAVs to be controlled through brainwave activity, thus overcoming the limitations of manual controls. EEG presents a novel solution by capturing the brain's electrical impulses and translating them into UAV control commands. The study focuses on computing pairwise distances between EEG channels O1, O2, C3, and C4 across six directional dimensions (B-backward, F-forward, U-upward, D-downward, L-left, R-right). It identifies and ranks the maximum and minimum distances between channel pairs for each direction to optimize channel selection. A directional distance framework is proposed to enhance EEG signal acquisition and improve UAV control precision. This research addresses the limitations of traditional UAV control methods, which lack hands-free, real-time adaptability, by integrating EEG-based brainwave control to improve accessibility and responsiveness. This innovative hands-free approach is especially beneficial for individuals with disabilities or in environments that demand multitasking. The brain-computer interface has real-world applications in fields such as agriculture, defense, urban planning, environmental monitoring, and healthcare, providing a more efficient and adaptive solution for UAV remote sensing.