
Registration Seminar

Seminar Title	: INTELLIGENT UAV NAVIGATION IN CLUSTERED ENVIRONMENT USING AI TECHNIQUES
Speaker	: Shubhashish Bhoi (Rollno : 523me6016)
Supervisor	: Dayal Ramakrushna Parhi
Venue	: SEMINAR ROOM, NEW MECHANICAL SCIENCE BUILDING
Date and Time	: 05 Jun 2025 (11.30 AM)
Abstract	: The evolution of Unmanned Aerial Vehicles (UAVs) into intelligent, autonomous systems has brought path planning and obstacle avoidance to the forefront of aerial robotics research. Efficient navigation in environments with stationary and moving obstacles poses significant computational and real-time challenges. This study investigates the performance of four nature-inspired optimization algorithms of recent times such as Sculpture Optimization Algorithm (SOA), Fast Jaguar Algorithm (FJA), Puma Optimizer Algorithm (POA) and Ant Lion Optimization (ALO) in generating optimal, collision-free UAV paths for complex scenarios. All the algorithms are going to be used in a 3D simulation environment with different obstacles densities and dynamics of motion. The UAV had to move from a given origin to a destination while seeking to optimize a multi-objective cost function that comprised path length, energy consumption, collision risk, and computational time. Various scenarios will be tested across different environments. This research would seek to develop a cost function that is multi-objective and would include path length, energy efficiency, computation time, and collision avoidance. Performance of the algorithms would then be measured in terms of convergence rate, adaptability, robustness, and optimality of the path.