The e-Yantra Project, funded by the Ministry of Education, hosts a competition aimed at training students in practical problem-solving using technology. With a focus on mastering skills such as Robot Operating System (ROS), Machine Learning, and Control System design. The competition emphasizes the **Sentinel Drone** (SD) theme, which involves assembling nano drones and mastering Geographic Information Systems (GIS) for automated surveillance tasks.

**Tasks Overview:**

Task 0: Installation of ROS Noetic and Gazebo Software.

Task 1: Building a PID control system to stabilize the quadcopter and generating a georeferenced image using the QGIS.

Task 2: writing a code for the existing PID control system, object detection from images, city area scanning using drones, and geolocating suspicious objects on a map.

Task 3: Hardware Information

Task 4: Drone Assembly  
Task 5: PID tuning of drone and camera calibration.

Task 6: Drone will surveillance area and send yellow colour object geolocations.

**Solution Development Concepts:**

Utilization of control systems (PID building).

Implementation of path planning.

Application of image processing techniques for marker detection.

Robot Operating System (ROS) for system development.

Gazebo simulator for simulation environments.

Python and its libraries for programming.

[Theme Video](https://www.youtube.com/watch?v=vSWQjc3xk84)

[Demo Video](https://www.youtube.com/watch?v=evg6zYMV03U)