AI and Robotics

1. Delivery Robot with Two-Wheeled Self-Balancing Bot (Problem ID: HACK-5806)

Description: A two-wheeled self-balancing robot that can autonomously deliver items within the college campus, such as documents, food, or books.

Problem Solving: This system improves the efficiency of delivery services within the campus, reducing human intervention and optimizing delivery routes.

Example: A student orders food from the campus cafeteria, and the delivery robot autonomously navigates the campus to deliver the food to the student's location.

2. Humanoid Robot (Problem ID: HACK-6820)

Description: A humanoid robot capable of performing basic tasks such as guiding visitors, answering queries, or assisting in educational activities.

Problem Solving: It can help reduce the workload on human staff, especially during events, and assist in repetitive tasks like answering frequently asked questions.

Example: A humanoid robot in the college library can guide new students on how to locate books, check out materials, or direct them to study rooms.

3. **<u>Autonomous Campus Guide Robot with Real-Time Indoor Navigation and Facial Recognition (Problem ID: HACK-9872)</u>**

Problem Description: The **Autonomous Campus Guide Robot** is designed to help students and visitors navigate the college campus efficiently. This robot can move on its own inside campus buildings using real-time indoor navigation. It also uses facial recognition to identify people and provide personalized assistance. The robot can guide students to classrooms, labs, or offices, and can even recognize faculty members to offer specific greetings or information.

Problem Solving: To solve this, the robot is equipped with sensors like LiDAR and cameras to detect its surroundings and avoid obstacles. It uses **SLAM (Simultaneous Localization and Mapping)** for indoor navigation to move safely around the campus. Facial recognition technology is used to identify registered individuals. When someone interacts with the robot, it scans their face, matches it with the database, and provides customized help like directions to their classroom or reminders about upcoming events. The robot can also answer frequently asked questions or alert staff if someone needs assistance.

Example: A new student enters the college and is unsure how to reach the physics lab. They approach the campus robot, which scans their face, confirms their identity, and then guides them to the lab. If the robot detects a faculty member, it can greet them by name and provide real-time updates or schedules. This makes campus navigation easier and enhances the visitor experience.