DETAILS ABOUT THE PROPOSED TOPICS:

1. **Sign Language Detector:**

In recent years, the application of deep learning techniques has revolutionized the field of computer vision, enabling a wide range of applications. This project focuses on leveraging You Only Look Once (YOLO), a state-of-the-art real-time object detection system, to develop a mobile application for sign language detection. **The proposed application** aims to **bridge communication barriers for individuals with hearing impairments** by accurately recognizing and interpreting sign language gestures in real-time. By utilizing YOLO's efficiency and accuracy, the application provides a seamless user experience, empowering users to communicate effectively through sign language. The project encompasses data collection, model training, and mobile application development, culminating in a user-friendly and accessible tool for sign language interpretation. Through this endeavor, we strive to contribute to the advancement of assistive technologies and promote inclusivity in communication.

2. **Self-Driving Car:**

The self-driving car project aims to develop an autonomous vehicle system utilizing TensorFlow Lite for Microcontrollers for both research and semester project purposes. This project involves implementing TensorFlow Lite on an RC car, training lightweight machine learning models on labeled image data for real-time object recognition, and integrating hardware components to enable autonomous navigation and obstacle avoidance. By leveraging TensorFlow Lite's efficiency and accuracy in running machine learning models on microcontroller-based platforms, the project seeks to bridge theoretical research with practical implementation, providing insights into the challenges and opportunities of deploying machine learning algorithms in real-world applications such as autonomous driving.

3. **Anomaly Detection in Satellite Images:**

The anomaly detection in satellite images project aims to develop a system capable of automatically identifying anomalies or unusual patterns in satellite imagery using machine learning techniques. By leveraging satellite imagery datasets and unsupervised learning algorithms such as isolation forests, one-class SVM, and clustering, the project seeks to detect anomalies indicative of environmental changes, urban development, or natural

disasters. Key components include data acquisition, preprocessing, machine learning algorithm implementation, and evaluation metrics to assess the performance of anomaly detection models. The project's outcomes include insights into environmental dynamics, potential applications in disaster response and urban planning, and contributions to research in remote sensing and machine learning for analyzing large-scale satellite datasets.