VISUAL SLAM UTILIZING ORB-SLAM 3

PROJECT GOAL:

- We intend to use **ORB-SLAM3** to perform SLAM reconstruction with comparison to the GPS data as Ground Truth.
- Perform feature tracking and recognition using OpenCV and MATLAB for stitching maps at subsequent frames and deduce a map out of it.
- The raw datasets will be corrected using filters as a part of sensor modelling on successive iterations since we need to reduce noise and biases to better our result. This process will be much clearer when we try to reconstruct the map and decide what needs to be corrected.

DATASET:

- We intend to use the '**car_IR_RGB_lidar'** dataset which was collected using Northeastern's autonomous car NUANCE.

PACKAGES AND REQUIREMENTS:

- We will be using ROS Noetic, Rviz and Pangolin will be used as visualizer and Interface for SLAM Reconstruction.
- We would be using modified version of **DBoW2** library to perform place recognition and g2o library for nonlinear optimization.

SENSOR / HARDWARE REQUIREMENTS:

- We won't be requiring any sensor or hardware.

QUALITATIVE AND QUANTITATIVE ANALYSIS:

- We will be performing qualitative analysis based on the performance of SLAM reconstruction using data taken from RGB Camera and IR camera provided.

PROJECT WORK DIVISION:

- Two members will work on running ORBSLAM3 with the **RGB camera** on the car_IR_RGB_lidar dataset.
- Two members will work on running ORBSLAM3 with the **IR camera** on the car_IR_RGB_lidar dataset.

Group1: Vignesh Ravikumar | Skanda Akkihebbal Prasanna | Pavan Rathnakar Shetty | Shanmugam Sankarakumar