Visual SLAM
Team 12

Project Goal: Use Visual SLAM techniques to reconstruct a 3D map of an outdoor environment.

What datasets will you work on? Will your team be collecting new datasets?

We will use the ‘car_IR_RGB_lidar’ dataset as a reference, and collect our own data with the NUance car.

What software packages are you going to use? Have you investigated what it needs for installation and inputs for running?

We are planning to use ROS to integrate data collected from the various sensors and then process the data. We will use ROS Noetic that runs on Ubuntu 20.04. The data will be collected in the ROSbag format and we are planning to do the processing using different available packages of ROS and Python. We are not sure at this point what other packages will be required for the processing of data and what exact packages we will be employing for this purpose. We might require NVIDIA GPU for processing the data. The inputs will just be the data extracted from the collected ROSbag.

Will your team need any sensors/hardware from the lab? Do you know how to use the hardware/sensors that you need?

We will need to schedule time with the NUance car. The car is equipped with some of the sensors that are required for the collection of our dataset. The sensors required would be RGB Cameras (synced to form a stereo pair), IR Camera, Lidar, IMU, GPS.

Are you doing any qualitative and quantitative evaluation on different datasets?

We will be doing a qualitative evaluation based on the dataset provided and the dataset that we collect on our own. Subsequently, we also plan to do analysis on different datasets and do performance evaluation and compare how different parameters affect performance in different kinds of environment.

Project Work Division:

We will start by doing some additional background research and going through the provided dataset together. This will allow us to find the specific direction we want to take the project, and we can break out tasks from there. If required, we can submit a clear work division at a later stage of this project.