

Project Title: LiDAR SLAM mapping system for autonomous driving system

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The goal of this project is to build a mapping system based on LiDAR to perform 2D mapping (and 3D mapping as optional goal) based on SLAM algorithm. The project might be able to base on the autonomous car with LiDAR and NVIDIA GPU in Prof. Faruque's lab. The system will scan the obstacle with LiDAR and generate the map of the environment in real-time. The ROS will be utilized in the project and a camera might also be involved. The vehicle should be able to run in any environment and sketch at least the 2D map in real-time basis.

Learning Objectives:

Get familiar with tools including LiDAR and ROS which is wildly used in autonomous driving industry.

Study and implement the SLAM algorithm with optional methods include Rtabmap, Gmapping, BLAM, LOAM, Google Cartographer, Hector SLAM, etc. (not all of them but may take some to compare)

Tools:

Primary: C/C++, ROS

Optional: Matlab, Python

Team Size: 2 (for team of 2, one focus on the SLAM algorithm and one focus on the robotic vehicle control)

Project Illustration:

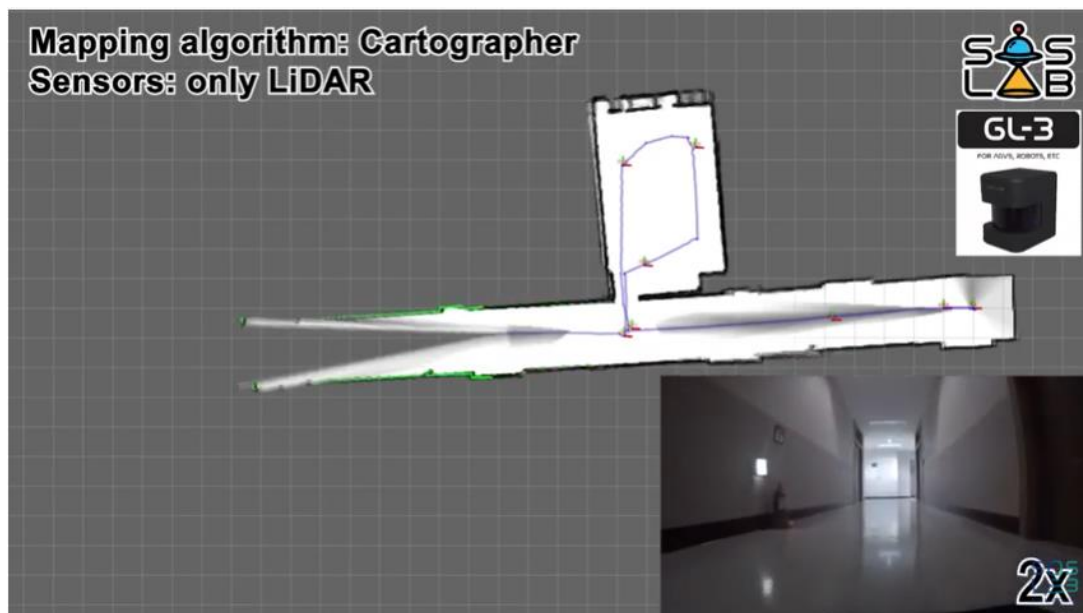


Image Reference: https://www.youtube.com/watch?v=AfsqIU_f-Go