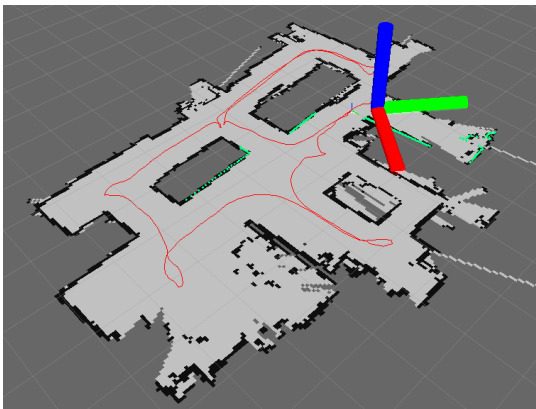


# AggiE-Challenge: Autonomous Building Lighting Assessments

## Currently recruiting students for a multi-disciplinary team

**Project Description:** The aim of the project is to develop a **commercially viable** device capable of automatically classifying, enumerating, and evaluating building lighting systems. To do this, the device will need to be able to map a building in real-time and identify the location and type of lights.



(Figure 1) Map generated with 2D laser-scanner and ROS on a ground robotic platform.

There will be two teams working in parallel to develop the device. One will develop a handheld platform (example shown in Figure 2a), while the other will develop a package capable of being placed on an unmanned vehicle (example shown in Figure 2b). Software development will be done in Linux, utilizing ROS and available open-source code as necessary. While separate, the teams can expect to collaborate and assist each other throughout the project.

- **3D Handheld Mapping Device** – the team will construct a handheld device capable of mapping the interior of a building while being transported by an individual. The team will have access to a Google Project Tango tablet and a 2D laser scanner to be used to sense the environment. They will also have access to an Intel NUC.
- **Autonomous Unmanned Vehicle** – the team will develop a package that can be installed on an air or ground vehicle. The vehicle will be expected to autonomously navigate the building. They will have access to a quad-copter, a ground platform, a 2D laser scanner, BeagleBone Black, and an Intel NUC.

**Students Needed:** Each team will consist of 5-6 students, sophomore through graduate level, with the ideal composition and experience listed below:

**Computer Science (2 Students):**

- Experience with Linux, ROS, C++, Python, Java, as well as hardware preferred

**Electrical Engineering (2 Students):**

- Experience with hardware, power systems, any coding experience preferred

**Mechanical Engineering (2 Students):**

- Experience with hardware, product design, any coding experience preferred

The work will be completed under the advisement of Dr. Bryan Rasmussen, and the team will work closely with PhD student Christopher Bay. To tackle such a project, the course is **two-semester long** (fall & spring) and students will be expected to participate for both semesters. Students will register for the course listed at the bottom, **1 credit-hour in the fall, 2 credit-hours in the spring**. The combined credits count for one elective course.

**Teams will officially meet twice a week on Mondays from 4:10-5:00 and at another time based on student schedules**, and will be expected to work on the project outside these times.



(a)



(b)

(Figure 2) (a) Handheld mapping device developed by Team Hector ([gkmm.tu-darmstadt.de/rescue](http://gkmm.tu-darmstadt.de/rescue)). (b) Example of quad-copter with 2D laser scanning package.

For more information about the project, please contact Christopher Bay at [bayc@tamu.edu](mailto:bayc@tamu.edu). To register for the course, look for course #: **ENGR 491-520 (CRN 28196)**.