Christopher Chinowth

NREIP (Naval Research Enterprise Internship Program) Intern

SPAWAR

Systems Center PACIFIC
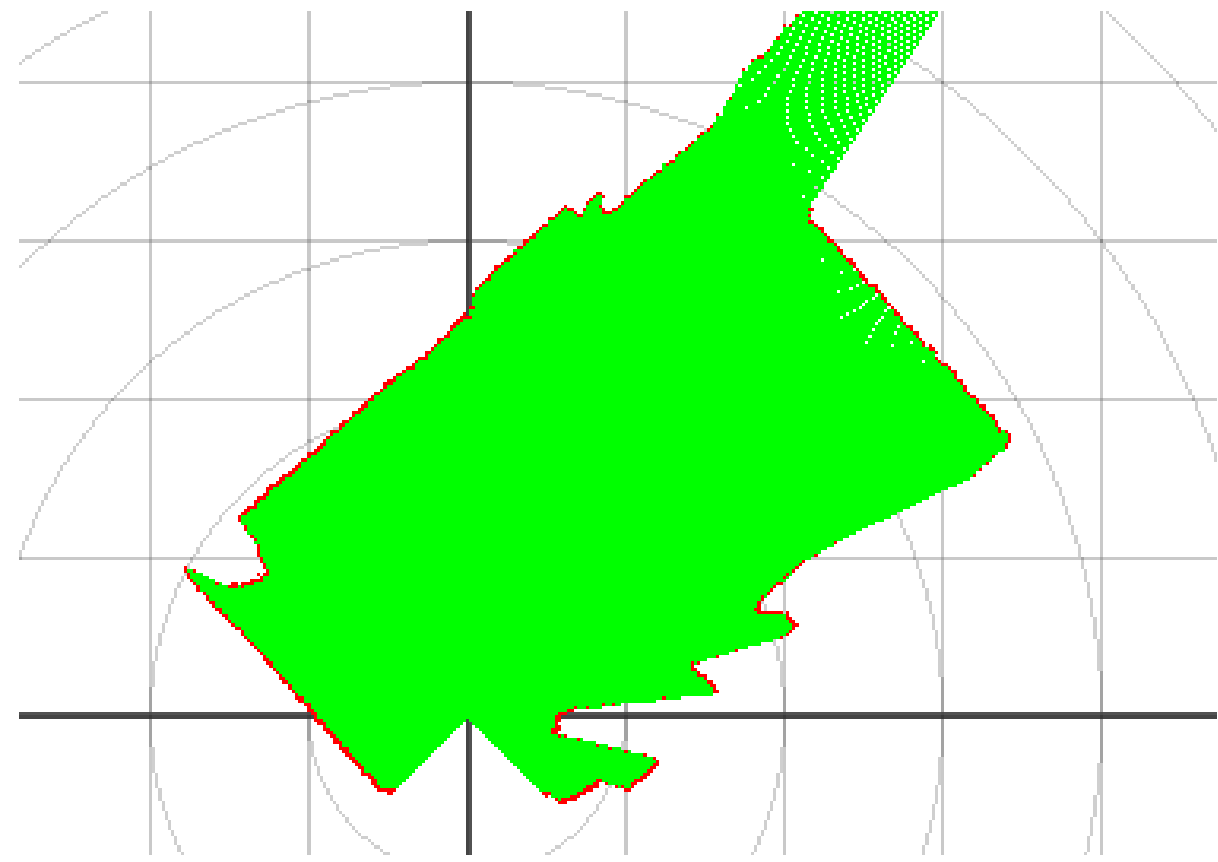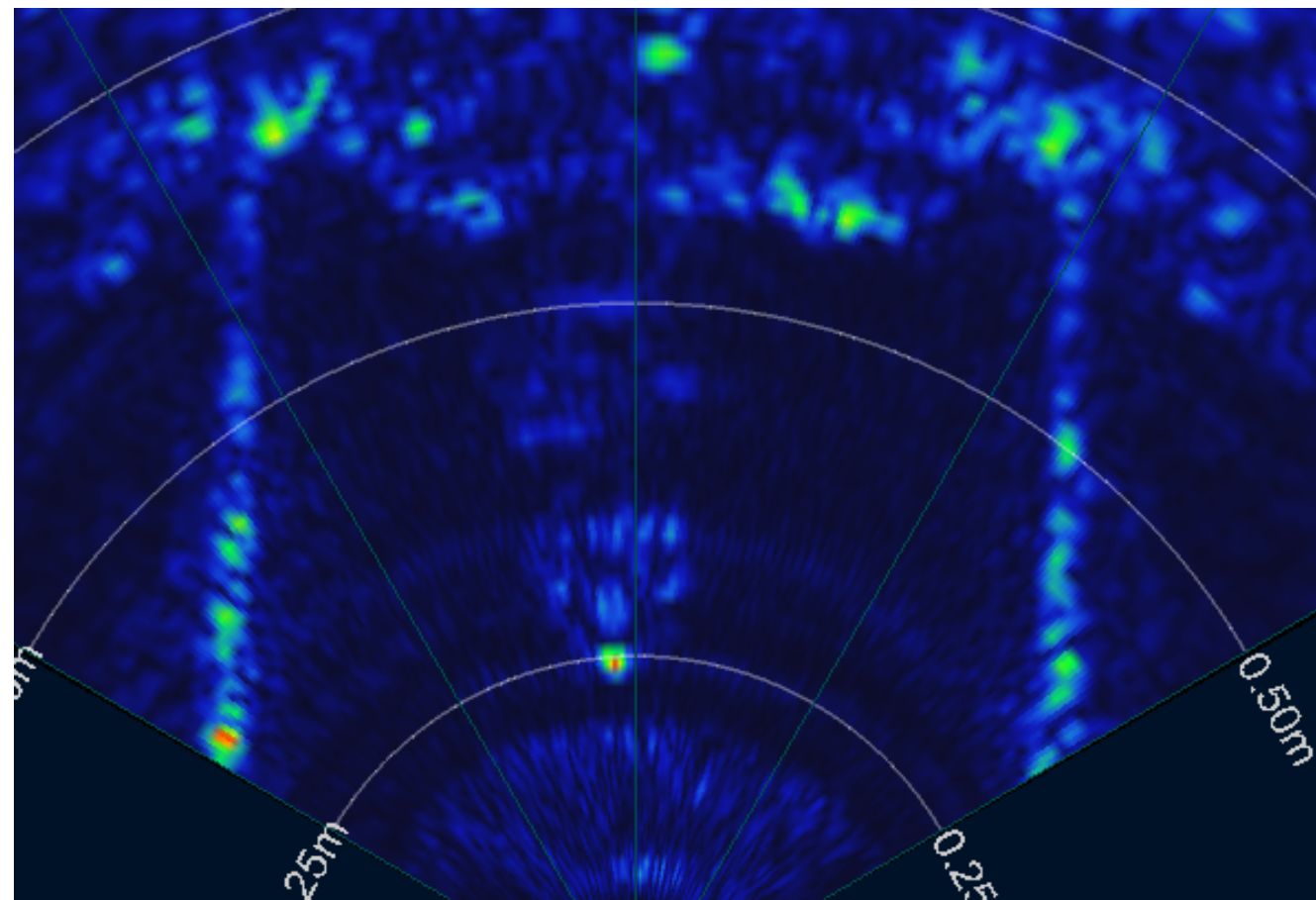
Space and Naval Warfare Systems Center Pacific

Integrating Sensors with a System of Autonomous Robots

HAMMER:

- Heterogeneous Autonomous Mobile Maritime Expeditionary Robots
- Create a system of autonomous vehicles in order to achieve better cooperation between vehicles for complex missions and increased autonomy.
- Hammer project combines surface, subsurface, and aerial vehicles to create a single system.
- Surface vehicle supports the underwater and aerial vehicles.
- My part of this grand project was to integrate various sensors so the system can respond to its environment better.

Achievements:

- Integrated LiDAR (Light Detection And Ranging) mechanism for responsive and accurate distance measuring above water's surface.
- Integrated SONAR (Sound Navigation And Ranging) device for gathering subsurface information
- Data from both sensors post to a shared database so all vehicles in the system can freely access the information.
- Bridged the database with ROS (Robot Operating System) so the data can be used with existing algorithms.
- Created graphical displays of the environments using the data from sensors.

UCSD Connection:

Courses that helped me during internship :
- CSE 110 – Utilized a lot of software engineering skills and techniques.
- CSE 12/100 – Knowledge of data structures helped me manage the data acquired from sensors.
- CSE 15L – I did a lot of configuring of Linux systems.

Courses that I want to take after internship:
- CSE 190 – One of the special robotics courses offered would be very interesting for me to take with the new skills I've acquired.
- CSE 167 – Drawing graphical representations of data has made me sort of interested in graphics programming.

Perks:

- Every other Friday off in exchange for 9 hour work days.
- Choose your own hours.
- Employees can work remotely for up to 25% of their hours.
- SMART program will pay for graduate school all the way up to a PHD.
- Lots of varied work, never get bored doing the same things every day.
- Really good technical seminars and lectures.
- Occasionally travel to exotic locations!