



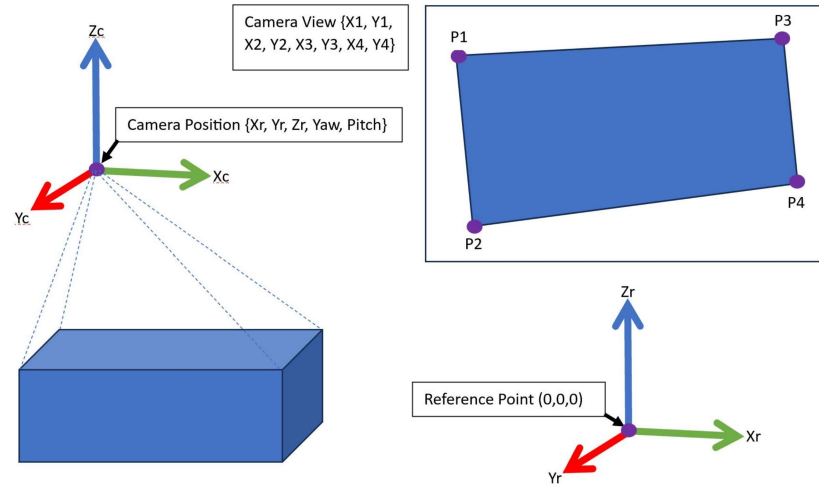
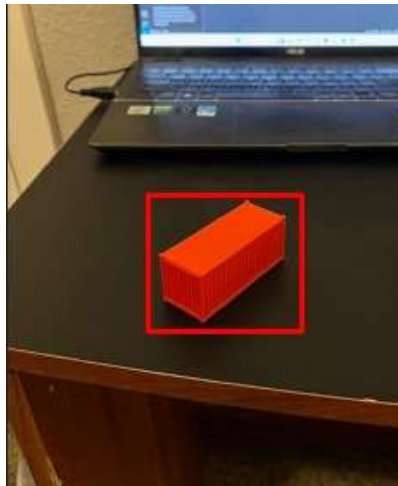
ODU

**Department of Electrical &
Computer Engineering**

ECE 487 SENIOR DESIGN PROJECTS

INNOVATING THE FUTURE IS WHAT WE DO

FALL 2024



Computer Vision for Cargo Containers

Funding Agency: ECE Department of ODU

The design objective of this project is to design a navigation system to improve port automation for the container transportation between a truck and a barge.

Team Members: *Alec Council, Tristan Mabe*

Advisors: *Dr. Chung Hao Chen, Dr. Gene Hou, Dr. Cong Wei*

Design Challenge

Utilize a UAV to locate a cargo container and report its location to the barge

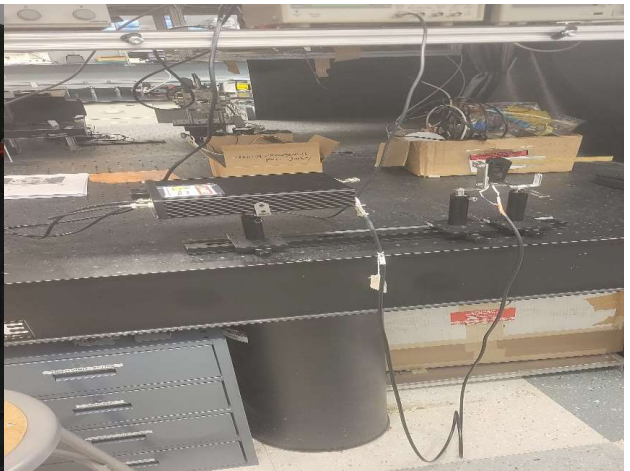
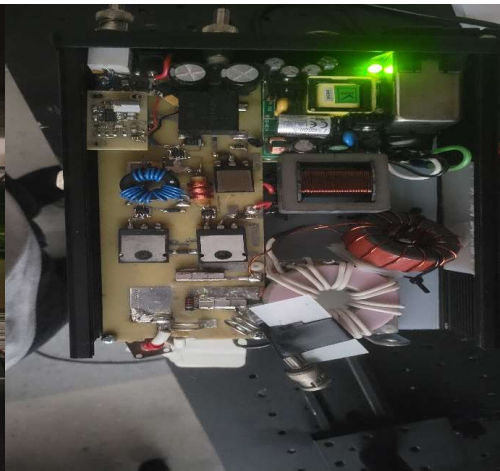
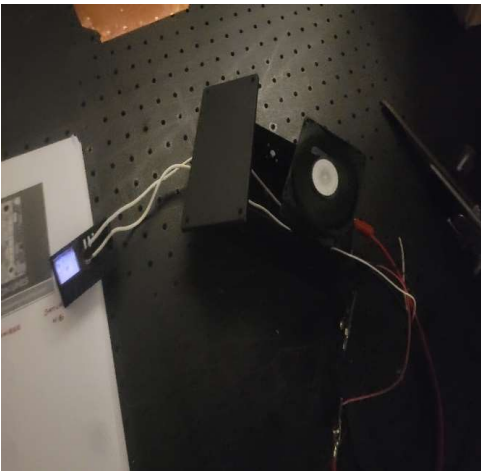
Design Goals

- Identify Cargo Containers utilizing Haar Cascade
- Utilize computer vision to report cargo container location from drone feed



“We are paving the way for a more efficient future!”

- Tristan Mabe



Far-UVC lamp for surface sterilization

Funding Agency: Eden Park

This project aims to design and develop power supplies for driving a micro plasma lamp to emit far-UVC light

Team Members *Kirsten Hamburg, Yun Sun, Kadeem Henry*

Advisor: *Dr. Chunqi Jiang*

Design Challenge

This project focuses on the power source for a lamp prototype, studying power-dependent far-UVC emission and evaluating power delivery efficiency and treatment efficacy.

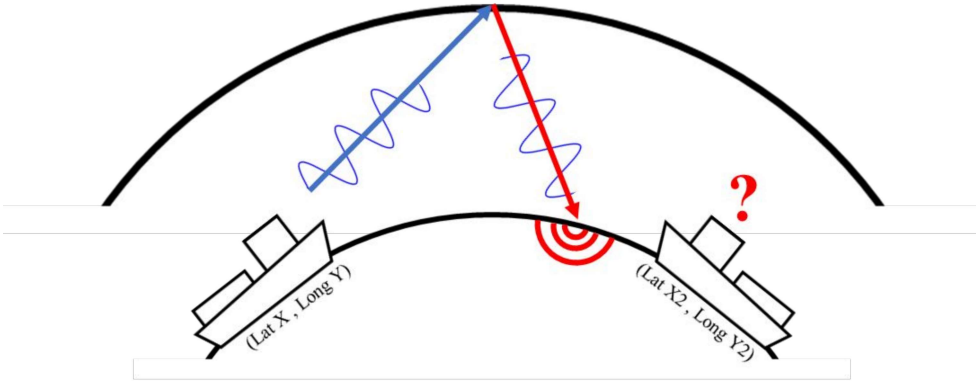
Design Goals

- Refining a pulsed generate or 12 V DC to AC transformer power source or t for an Eden Park provided lamp prototype.
- Studying the correlation between power levels and far-UVC radiation emission using a specialized meter.
- Assessing the device's ability to deactivate microorganisms across different power configurations.

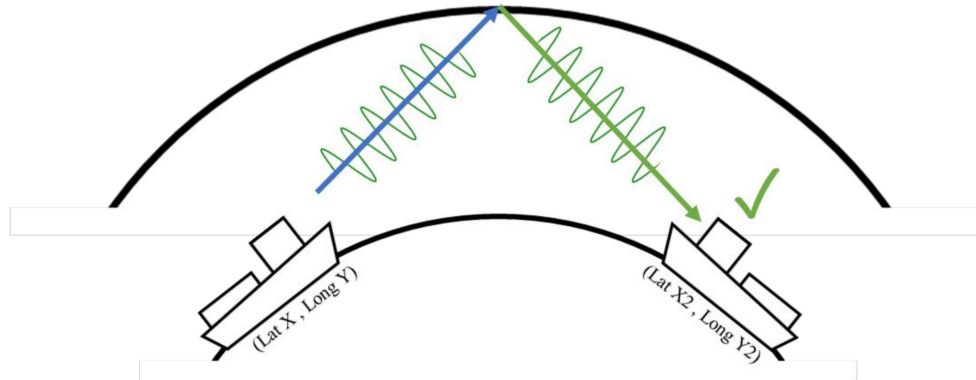


“Innovation is not the product of logical thought, although the result is tied to logical structure.” - Albert Einstein

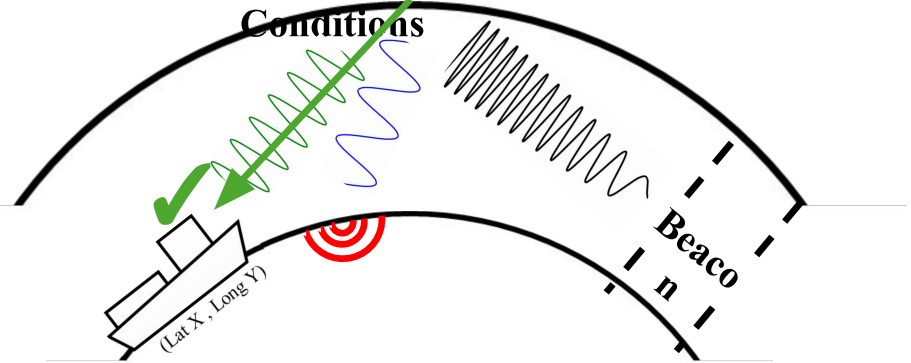
Ionospheric Conditions



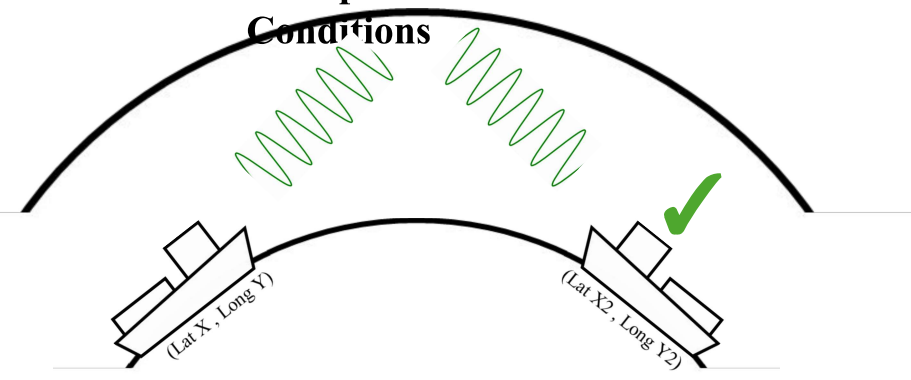
Ionospheric Conditions



Ionospheric Conditions



Ionospheric Conditions



Real-Time High-Frequency Propagation Observation System

Funding Agency: Innovative Futures LLC

Design and create a deployable transmitter to aid in developing a systems approach to measure the propagation of High Frequency(HF) Signals

Team Members: *Garrett Hunsicker, Roman Klinger*

Advisors: *Dr. Linda Vahala, Dr. Dennis Watson*

Design Challenge

Develop a beacon capable of emitting HF signals

Design Goals

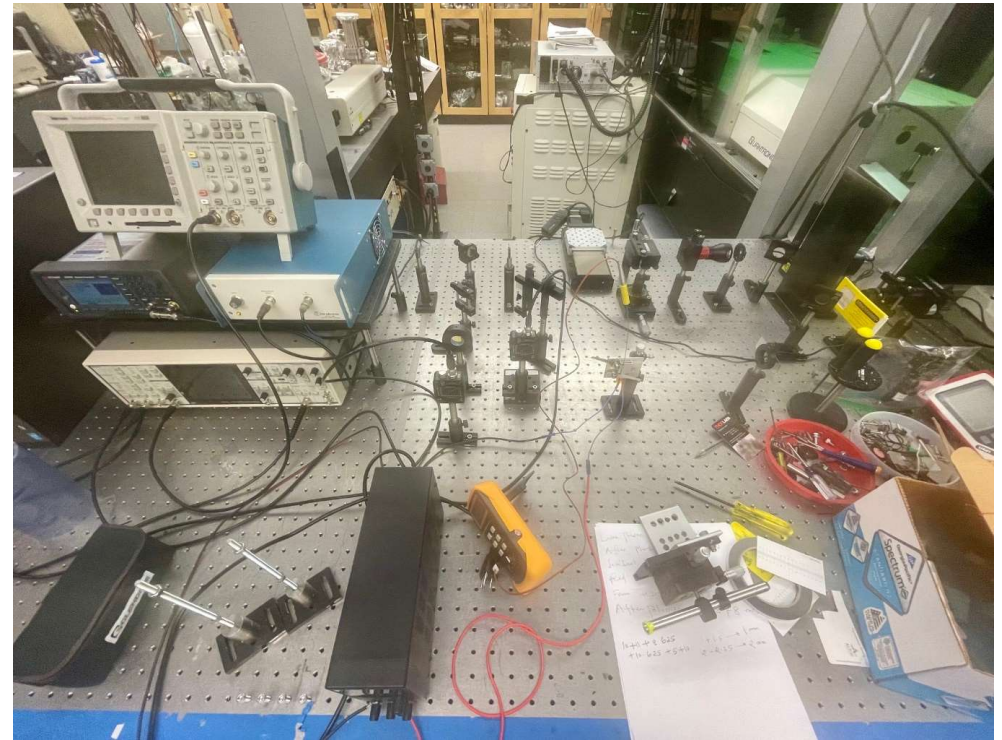
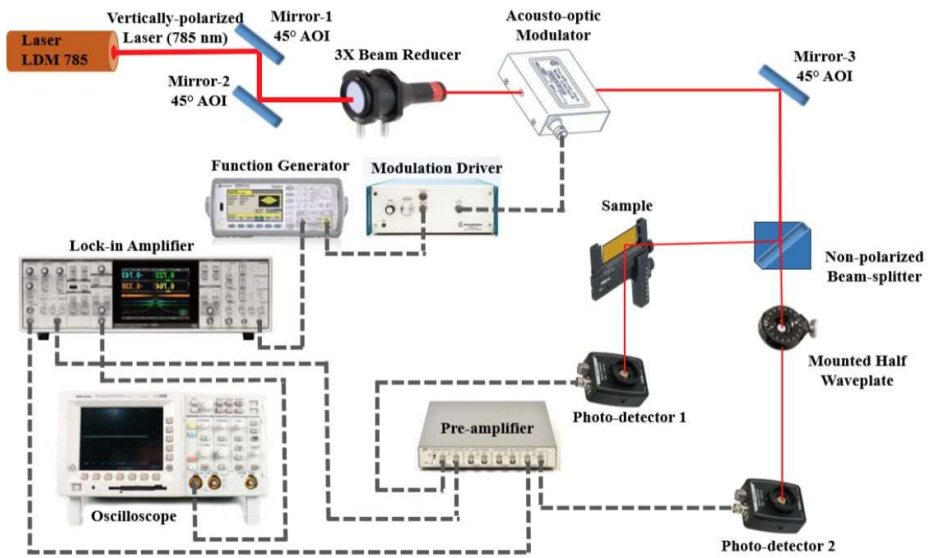
- Develop a Self-Powering Circuit
- Integrate with an Internal GPS
- Integrate with a HF Transmitter
- Develop a Deployable Containment



“

Primary causes are unknown to us; but are subject to simple and constant laws, which may be discovered by observation, the study of them being the object of natural philosophy.

”



Laser-Based Temperature Measurement

Funding Agency: VMEC

This project aims to develop a laser-based optical temperature sensor for detecting Joule heating in devices like resistive memory cells.

Team Members: *Aaron Gawer, Harrison Savignac*

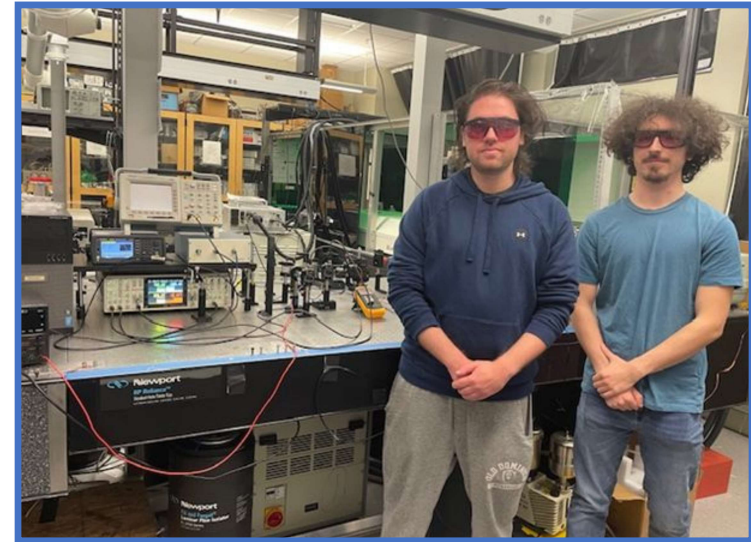
Advisor: *Dr. Hani Elsayed-Ali*

Design Challenge

Create a non-contact, laser-based optical temperature sensor.

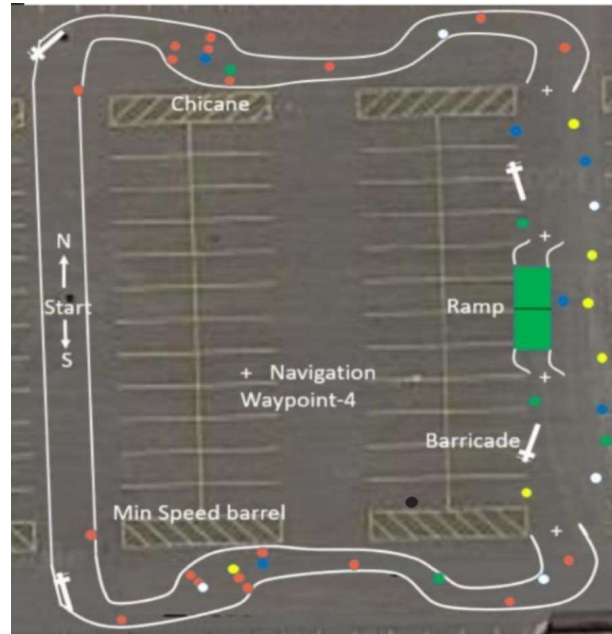
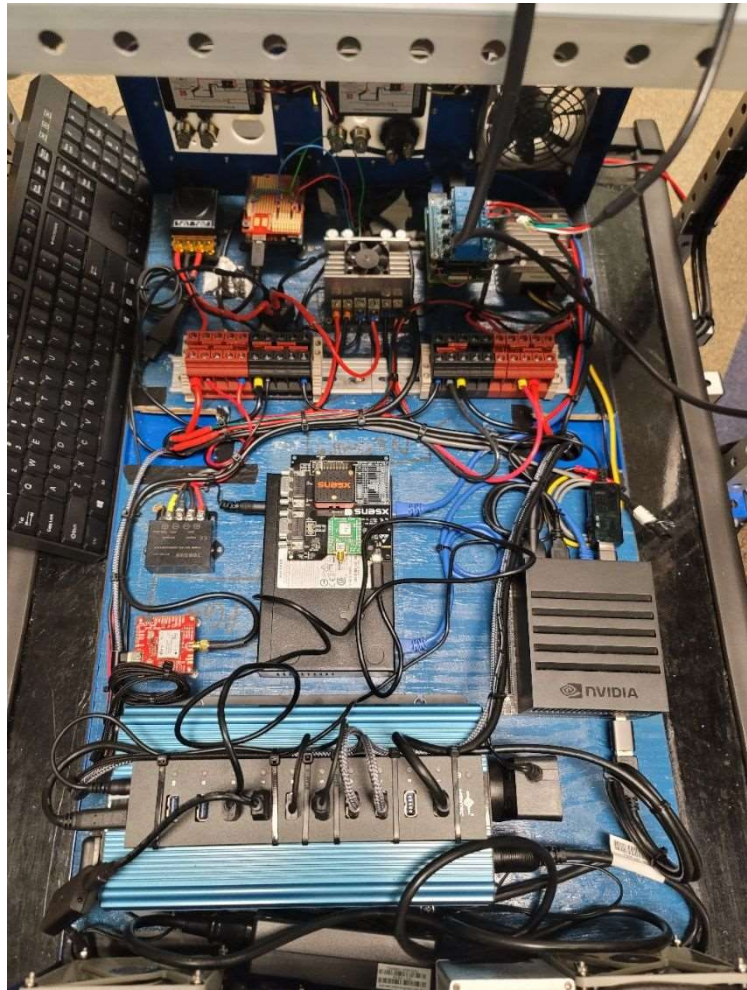
Design Goals

- Achieve temperature measurement with a few Kelvin accuracy.
- Provide sub-millisecond time resolution for dynamic heating detection.
- Ensure the sensor is applicable for testing on metal lines and resistive memory cells.



**“Precise, accurate, and efficient.
Laser focus, if you will.”
-Harrison Savignac**





Autonomous Intelligence Ground Vehicle

Funding Agency: ODU/NNS Apprentice School

Design and Construct autonomous vehicles that will qualify and compete in the 2025 IGVC competition

Team Members : *Jarub Ellenwood, Christopher Griffin*

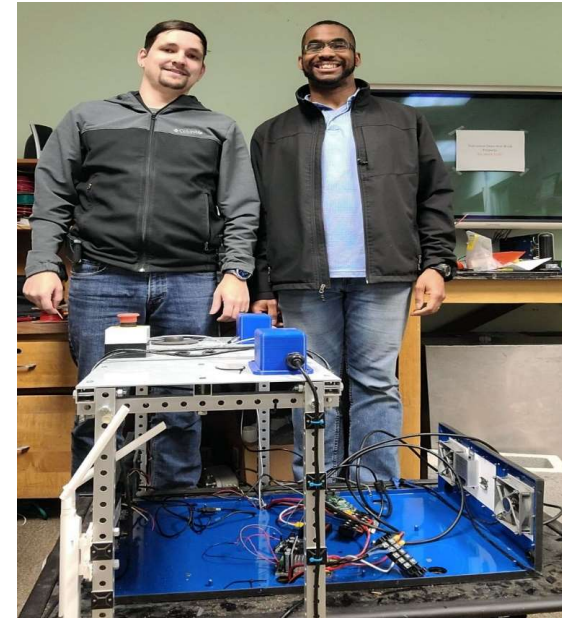
Advisor: *Dr. Lee Belfore*

Design Challenge

Modify and upgrade the existing variation of the Little Blue vehicle to qualify for the 2025 IGVC competition.

Design Goals

- *Improve E-Stop, E-Light, LIDAR, Power Distribution and Software Systems.*
- *Improve highly accurate and precise GPS technology.*
- *Begin creation of AI neural network training simulation.*
- *Build a vehicle that qualifies for IGVC competition.*



“

We are not what we know but what we are willing to learn

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