



MIDN 1/C Robert Inglis

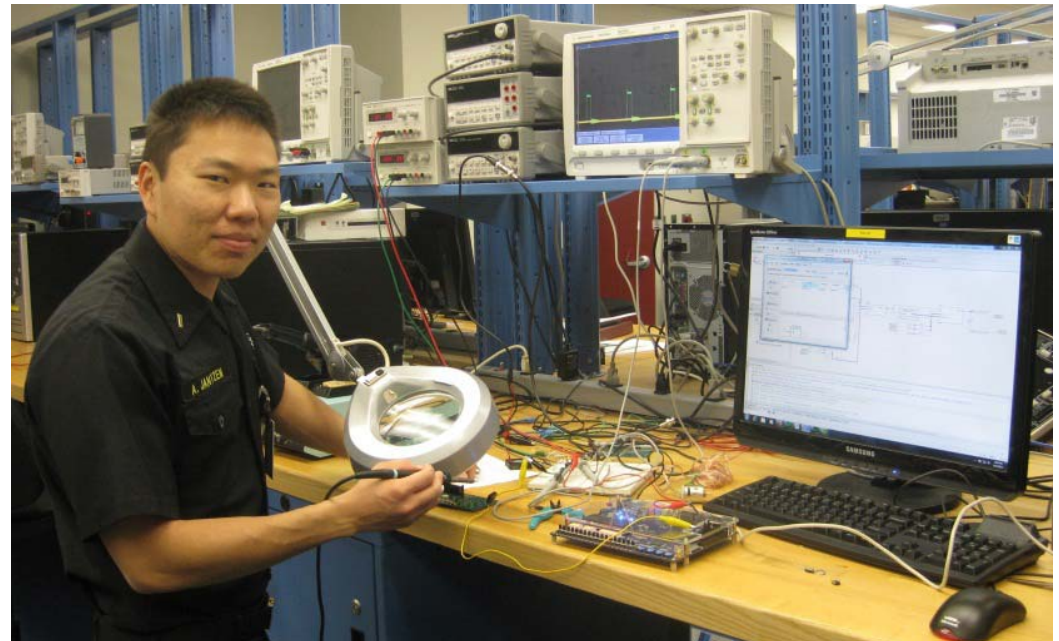
*Securing the Matrix: Wireless Sensor Network Security*

The purpose of this project is to develop a limited cyber security system for a wireless sensor network (WSN). Built on the WSN Radio Tomography network designed by previous teams, the system detects and profiles vehicular traffic within the network. The focus is on improving network performance and implementing solutions to network security threats, with an emphasis on Encryption, Jamming Mitigation, Node Integrity, and Network Topology. Network testing is conducted on both the base and implemented project code.

MIDN 1/C Anand Jantzen

*Motor Control Through Power Electronics*

This project focused on designing and creating a DC motor control system using power electronics to demonstrate the conversion of electric energy to mechanical energy. The system was comprised of three parts: controller, power electronics circuit board, and a motor. Design focus was on making the printed circuit board small using surface mount components.





MIDN 1/C John Gale, MIDN 1/C David Hoyle  
MIDN 1/C Reagan Sanders

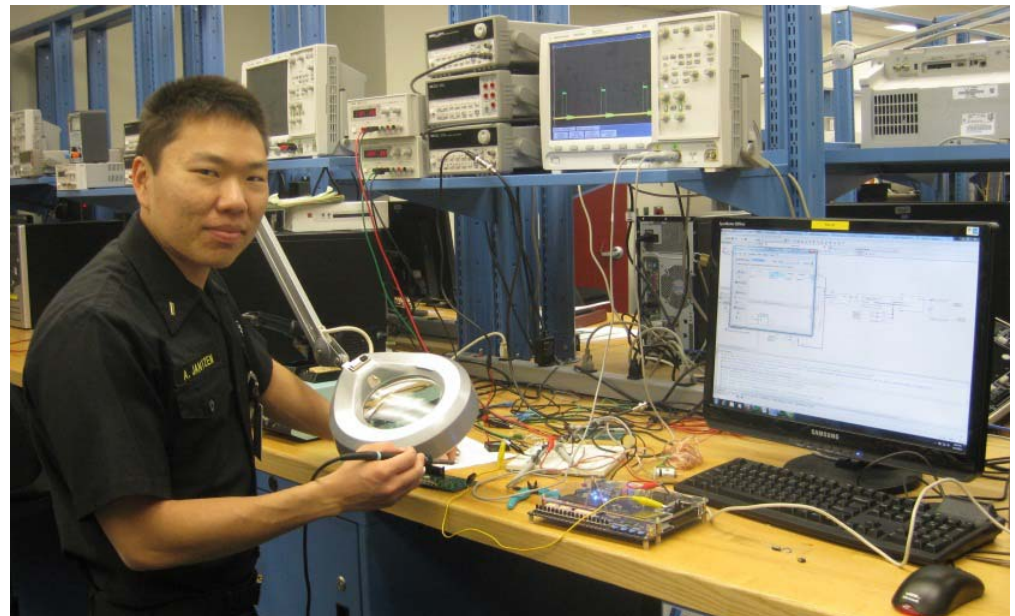
#### Too Hot to Handle

With improved smartphone and tablet technology, it is becoming increasingly feasible to implement powerful biometric recognition algorithms on portable devices. This research focuses on trying to improve the energy efficiency of these algorithms, making them faster and thereby reducing the amount of energy required from the battery. We specifically look at the differences between integer and floating point math, Java and C-code, as well as different loop optimization techniques. Substantial savings in energy could result if some of these changes were implemented on existing biometric algorithms

MIDN 1/C Anand Jantzen

#### Motor Control Through Power Electronics

This project focused on designing and creating a DC motor control system using power electronics to demonstrate the conversion of electric energy to mechanical energy. The system was comprised of three parts: controller, power electronics circuit board, and a motor. Design focus was on making the printed circuit board small using surface mount components.







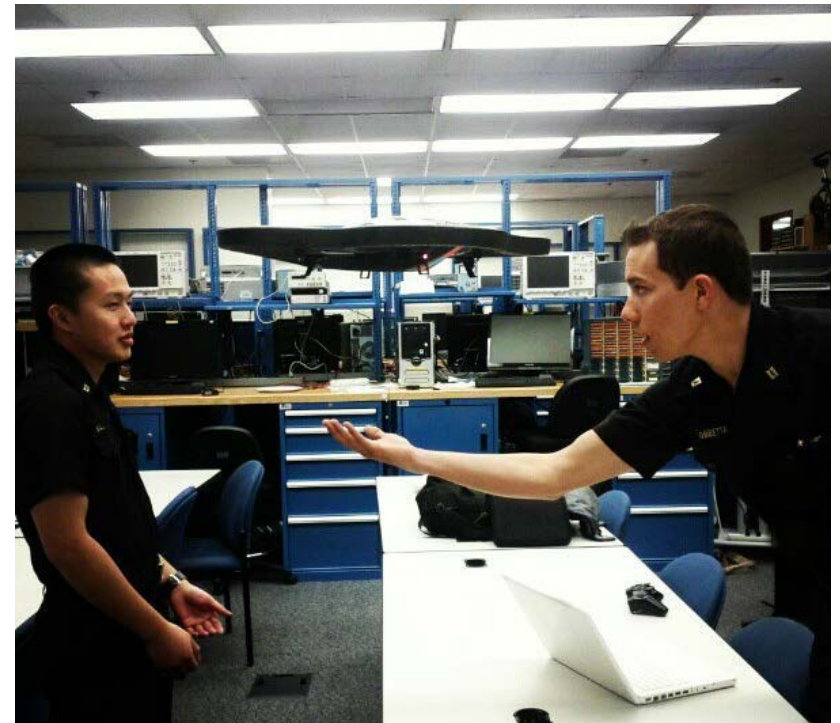
MIDN 1/C Adam Goetz

*Optical Switching Using High-Resistivity Silicon:  
Enhancing RF Communication and Optical Sensing*

This research examined optical switches made from high resistivity silicon and their potential application with microstrip structures. The project focused on the fabrication, integration, and testing of these optical switches. Conductive and non-conductive silicon states were observed during proof of concept testing. An optical switch was also integrated in a 5GHz patch antenna and the antenna behavior observed when 975nm and 1060nm light was applied to the switches.

MIDN 1/C Tyler Trombetta  
MIDN 1/C Sunny Tsao  
Surveillance and More Drone

The goal of this project was to design and successfully build a small flying drone that can fly above the battlefield and track people or vehicles on the ground. It provides real-time video and drone data to a user on the ground and highlights the people or vehicle it is tracking. The drone will track the target and follow it autonomously.





MIDN 1/C Praveen Murthy

MIDN 1/C John Tortorich

Modeling a Tidal Turbine's Power System

Tidal energy is a green energy source that is becoming more and more popular due to its clean emissions and low cost. The goal of this project is to model a tidal turbine power system that can power a moderately sized client by simulating the turbine with a motor, choosing a generator that matches a turbine's characteristics, creating a resistive load that controls the amount of torque and rotation the turbine can have, choosing an effective dump load controller, and maintaining high efficiency while generating electrical power.