Sydney Overton

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Education

UNIVERSITY OF MARYLAND

Pursuing Ph.D. in Electrical Engineering
Expected completion: August 2027

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

B.S. Electrical Engineering | May 2019
B.A. Physics | May 2019
Minor: Astronomy
GPA: 3.53

Experience

SEPTEMBER 2019 – OCTOBER 2022
Electrical Engineer | Naval Surface Warfare Center (NSWC), Carderock Division

- Coordinate and execute testing for Navy vessels, scale models, and range modeling verifications.
- Develop analysis methodology and software (MATLAB, LabView) for various platforms.
- Analyze and communicate magnetic and electric data results with key stakeholders.
- Author reports for testing events and present data to the underwater EM community.
- Calibrate USN submarines to meet required electric signature limits. Resolve electric corrosion protection system settings to minimize electric dipole moment.
- Direct the objectives, test planning, execution, and reporting for scale model testing for the Columbia-Class (CLB) submarines. Develop entry and exit criteria for each test based on programmatic needs. Complete tests in conjunction with the Naval Research Lab and direct plan based on test criteria. Analyze all test data and create test report for the CLB Program Office.
- Contributed sparse inversion analysis and software to innovate the electric signature model for US Navy vessels.
- Completed analysis on the conductivity gradient in the port channel at Norfolk, VA. Coordinated with Program Office to collect the data and analyze the conductivity data to determine the existence of depth-conductivity gradients. Analyzed the effect of small conductivity errors on modeling associated with vessels over the sensor array located in the Norfolk channel.
- Developed and validated track merge program rotating data from a sensor array.
- Directed sensor array calibration effort. Led on-site analysis for the calibration of a shallow electromagnetic sensor array. Developed software to support the on-site and post analysis of electromagnetic calibration source data. Led team to complete post analysis on data to localize sensor array from GPS information and a known source. Reported results in an internal report. Presented calibration findings during brief to the program manager, senior scientists, and other key stakeholders.

AUGUST 2018 – MAY 2019
Undergraduate Research Assistant | Electrical Equivalence of Blood Brain Barrier Membrane
BioElectroMechanical Systems Lab at Virginia Tech

- Investigated an equivalent electric circuit of the Blood Brain Barrier. Worked independently to develop device and test methodology.
- Designed a three-layer microfluidic device based on Wheatstone Bridge to measure the impedance of the Blood Brain Barrier endothelial cellular membrane, specifically the tight junction. Modeled device mold with AutoCAD and printed using CADworks MiiCraft Microfluidics 3D Printer. Calibrated new microfluidic 3D printer.
- Troubleshot mold resolution issues and polydimethylsiloxane (PDMS) curing inhibition from mold resin. Created new protocol for PDMS microfluidic 3D printed mold prints.
- Produced and prepared microfluidic device layers and constructed microfluidic device with two PDMS layers and thin membrane. Integrated device with plasma enhanced bonding.
- Tested devices for obstructions/print errors in microfluidic channels and microfluidic device layer bonding quality.
- Investigated the flow of material across the tight junction while subject to impedance spectroscopy, through fluorescents and other experimental methods.
- Assisted a graduate student with measurements and analysis of cellular recovery from electroporation. Measured cellular contractions on nanofibers following high voltage pulses to determine recovery time.
- Worked with Dr. Rafael Davalos as my research advisor.

AUGUST 2018 – MAY 2019
Team Leader for Undergraduate Senior Design Project | Nanofabrication of Transducers for
Non-invasive Deep Brain Stimulation | The Bradley Department of Electrical and Computer
Engineering

- Engineered a magnetic nanotransducer for deep brain stimulation (DBS). Formulated a design for layer deposition of transducer thin-film layers with subsequent ellipsometry characterization of said thin-films.
- Optimized deposition of iron oxide, titanium nitride, and aluminum oxide via magnetic sputtering and electron beam deposition for desired thickness and film characteristics.
- Led team meetings, coordinated, and updated Dr. Wei Zhou (Virginia Tech, project faculty SME), and communicated periodic results to sponsor (Micron).
- Created and presented a poster displaying project objectives, hypothesis, methodology, and results.
- Presented a talk about the project to sponsor (Micron), faculty, and guests at Senior Design Symposium in April 2019. Received award for best overall project at symposium.
- Experienced with: ellipsometry equipment/software, thin-film deposition equipment, thin-film characterization equipment, and transducer layer deposition/characterization equipment.

MAY 2017 – AUGUST 2017, MAY 2018 – AUGUST 2018
Electrical Engineering Intern | NAVAIR, Fleet Readiness Center East

- Authored and reviewed technical documents for the RQ-21 Blackjack UAV platform.
- Designed and assembled test stand for platform verification. Collected and repaired components from platform squadron to serve as a functional computer stack in order to simulate phantom missions for verification on lab test stand.
- Worked directly with operational level personnel to troubleshoot issues with computer stack functionality. Also worked with personnel to evaluate future needs of the platform and communicate platform requests to management.

Leadership Experience

JANUARY 2018 – DECEMBER 2018
President, IEEE Eta Kappa Nu Honor Society | Virginia Polytechnic Institute and State University

- Planned chapter meetings, partnered with IEEE leadership to create joint events for Virginia Tech ECE students.
- Supported departmental outreach for ECE students.
- Networked with companies for recruitments and networking events for Eta Kappa Nu members.

JANUARY 2017 – MAY 2019
Mentor, IEEE Eta Kappa Nu Honor Society | Virginia Polytechnic Institute and State University

- Planned tutoring events for students in the ECE.
- Provided educational resources and one-on-one tutoring sessions through Eta Kappa Nu for lower level electrical and computer engineering courses.

Awards and Recognitions

- 2021 Junior Technical Person of the Year for Division 75, NSWC, Carderock Division.
- Q4 2021 Junior Engineer of the Quarter for Department 70, NSWC, Carderock Division.
- Q4 2021 Junior Engineer of the Quarter for Division 75, NSWC, Carderock Division.
- Q1 2021 Junior Engineer of the Quarter for Division 75, NSWC, Carderock Division.
- 2020 Junior Technical Person of the Year for Division 75, NSWC, Carderock Division.
- Q1 2020 Junior Engineer of the Quarter for Division 75, NSWC, Carderock Division.
- 2020 Science, Mathematics, and Research for Transformation (SMART) Scholar Symposium Nominee based on technical accomplishments and outstanding impact at NSWC, Carderock Division.
- 2017 Richardson Physics Award for Outstanding Student in Physics.
- 2016 - 2019 SMART Scholar Scholarship Recipient by United State Department of Defense.

Skills, Techniques, and Clearances

- Experience and training for biohazard Level 2 lab.
- Trained in passaging biological cultures, pipetting, general cellular analysis, and microscope usage.
- Trained on PVD, ellipsometry analysis, X-ray diffraction, and fabrication clean room procedures.
- Fluent in MATLAB, LabView, C, and C++.
- Modeling with Autodesk CAD software.