Christopher Rector

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Education

Old Dominion University

Master of Science, Computer Science — May 2022

State University of New York at Buffalo — **Magna Cum Laude**

Bachelor of Science, Mechanical Engineering — May 2017

Bachelor of Arts, Mathematics — May 2017

Employment

United States Navy — 2017 - Present

Professional Experience

State University of New York at Buffalo — **2016 - 2017**

Student Assistant

- Created a curriculum for a class designed for mechanical engineering students, in which they were introduced to topics such as data acquisition, calibration, and control.

- Tasks including writing usage manuals for sensors and actuators to be used with Arduino microcontrollers, modeling and machining adapters for the equipment, and designing lab experiments for the students.

Competencies

Languages: C/C++, Python, Java, MATLAB, R, LaTeX, Markdown, HTML, BASH

Software: Solidworks, Creo Parametric, AutoCAD, ANSYS, Git

Technical: Machining, woodworking, prototyping

Research

Medical Ventilator — **2020**

Advisor: Dr. Gregory Booth

- Developed the printed circuit board (PCB) for a medical ventilator operated by a microcontroller

- Device was approved for patent, with the data published in the Critical Care Explorations journal

ECG and Pulse Oximeter Device **2019 - 2020**

Advisor: Dr. Gregpry Booth

- Developed a PCB for a combined ECG and pulse oximeter device

- Device was used to study hemodynamics and considered for use in human clinical trials

Closed Loop Irrigation System **2016 - 2017**

Advisor: Dr. Rahul Rai

- Capstone project which investigated the use of closed loop control systems with applications in an agricultural irrigation setting.

- Created a system which would autonomously monitor and control the moisture content of the soil using an array of sensors and a feedback system to achieve maximal efficiency of use of water resources.

Metamaterials Research **2016 - 2017**

Advisor: Dr. Mostafa Nouh

- Participated in a project focused on understanding the dynamics of a class of acoustic metamaterials which comprise locally resonant components from a dynamic perspective.

- Developed a mathematical framework to optimize and further tune these materials to noise control applications, utilizing tools from linear systems, dynamics, and structural vibrations to carry out the necessary work.

- Used a Doppler Scanning Laser Vibrometer to measure and validate the numerically predicted response and dynamic characteristics of this class of materials.

Mobile Based Cable Robot **2015 - 2016**

Advisor: Dr. Venkat Krovi

- This research project looked into the difference in the control of a mobile base cable robot with a square frame as opposed to one with a circular frame.

- Assessed the limitations presented by the corners of square frame and the control singularities presented by certain configurations of the circular frame robot.

Awards

1st Place Team – Navy-Wide Academic Research Comptetition **2020**

- Machine Learning for Hemodynamic Prediction

2nd Place Team – NMCP Academic Research Competition **2020**

- Monitor Development Substudy

Publications

Cole, J. H., Hughey, S. B., Booth, G. J., Rector, C. H. (2020). A Novel Low-Cost Ventilator for Use in a Worldwide Pandemic: The Portsmouth Ventilator. Critical Care Explorations, Vol 2 (Issue 12), pg 292. https://journals.lww.com/ccejournal