Joseph Bruno

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EDUCATION

Temple University, Philadelphia PA **M.S. Electrical Engineering** GPA: 3.89 **January 2021-Present**
The College of New Jersey, Ewing NJ **B.S. Electrical Engineering** GPA: 3.25 **August 2016 – May 2020**

RESEARCH & WORK EXPERIENCE

Computer Fusion Laboratory – Temple University **January 2021 - Present**
Graduate Research Assistant

- Designed multi-agent fleet to autonomously navigate maritime environment. Performed control testing and sensor characterization on each vehicle created.
- Created digital twin models of drones, surface vehicles, and submarines to simulate localization and mapping of unknown terrain.
- Contributed to deep learning image recognition algorithm to identify non-desirable entities along the outside perimeter of a ship.

Triad RF Systems **July 2020 – December 2020**
RF Engineer I

- Designed, characterized, and tuned RF circuits for power amplifiers.
- Performed radio communication stress tests to gauge effective distance of amplifiers.
- Troubleshot defective RF circuits back to functionality.

Laboratory for Embedded Control and Optimization - TCNJ **June 2018 – September 2020**
Undergraduate Research Assistant

- Created architecture for an analog model predictive control algorithm on field programmable analog array and benchmarked against other controllers.
- Tested analog and digital algorithms on rapid dynamic system to prove feasibility of embedding MPC on a highly configurable platform.
- Aided in development of a new analog MPC algorithm proving to be more robust and scalable by reducing computational cost to solve.

TECHNICAL SKILLS

Software ROS, Linux, MacOS, AutoCAD, Raspberry Pi OS, Altium, LabVIEW, Netlogo, Pytorch
Code MATLAB, Simulink, LaTeX, Git, Python, Java, HTML, C, C++, Verilog
Hardware Circuit Troubleshooting, Arduino, FPGA, FPAA, PLC, RF Design, Hobby Electronics

HONORS & AWARDS

- American Control Conference Student Registration Grant 2021
- Temple University Graduate Research Associateship
- Fred O. Armstrong Leadership Award 2020
- TCNJ Dean's List (Fall 2018 – Spring 2020)

PRESENTATIONS & WORKSHOPS

1. **Joseph N. Bruno**, Ambrose A. Adegbege, **"Analog Computing Circuits for Rapid Control Development and Real-Time Application"** Celebration of Student Achievement 2019. Poster
2. **Joseph N. Bruno**, Hussain I. Khajanchi, **TCNJ IEEE Workshop on MATLAB**. Workshop
3. Hussain I. Khajanchi, Michael A. Ralea, **Joseph N. Bruno, TCNJ IEEE Workshop on Verilog and FPGAs**. Workshop

SERVICE & LEADERSHIP

IEEE Student Body President | TCNJ **May 2019 – May 2020**

- Organized technical seminars to introduce students to a wide variety of industrial and academic researchers.
- Collaborated on event planning with wider engineering department faculty and leaders to organize company visits, social gatherings, and workshops.
- Grew undergraduate interest in IEEE organization in the local region by advertising and planning local events.

Eta Kappa Nu Founding Member | TCNJ

- Introduced the honors society to the engineering department.
- Aided in selection process for first official class.

Robotics Camp Counselor | TCNJ **Summer 2019**

- Lead group of high school students through designing and testing autonomous two-wheeled robots through unknown maze.
- Organized and ran activities for students to collaborate and work as a team.

PUBLICATIONS

[1] **Joseph N. Bruno**, Franklin D. Moran, Hussain I. Khajanchi, Ambrose A. Adegbege, **"Analog Solver for Embedded Model Predictive Control with Application to Quadruple Tank System"** American Control Conference 2021

[2] Hussain I. Khajanchi, **Joseph N. Bruno**, Ambrose A. Adegbege, **"An Embedded FPGA Architecture for Real-Time Model Predictive Control"** International Federation of Autonomous Control 2020