Derrick Joyce Jr.

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EDUCATION

Georgia Institute of Technology **Atlanta, GA**

M.S. in Robotics *Expected May 2025*

- **Concentrations:** Perception, Artificial Intelligence, Human-Robot Interaction
- **GPA:** 4.00/4.00, President's List
- **Awards:** 2023 National GEM Consortium Fellow

Clemson University **Clemson, SC**

B.S. in Computer Engineering, Minor in Mathematical Sciences *May 2023*

- **Concentrations:** Computer Vision, Embedded Systems, Machine Learning
- **GPA:** 3.88/4.00, 6x President's List
- **Extracurriculars:** Resident Assistant **(2020-2023)**, Tiger Alliance **(Mentor)**, NSBE **(Vice President)**

EXPERIENCE

MIT Lincoln Laboratory **Lexington, MA**

Tactical Defense Systems Intern

Project: Message Response Plugin *Aug 2023 – May 2023*

- Designed and implemented a dynamically loadable software plugin for UDP packets
- Plugin capabilities: Input and output bit-sequences, bit-parsing, and pattern-matching
- **Programs**: C++, Linux OS, Qt 6.5 API, JIRA

Project: Digital Frame Sync (DFS) for Airborne Sensor Test Bed *Aug 2022 – May 2022*

- Integrated hardware (digital and analog) and wrote software for a system responsible for generating timing signals from a ground-based sensor to the Airborne Sensor Test Bed
- **Programs:** C++, Linux OS, Qt GUI 5.15, JIRA

RESEARCH

ECE Summer Undergraduate Research Experience (SURE) **Clemson, SC**

Undergraduate Student Researcher *Jun 2021 – Aug 2021*

Project: Active Physical Unclonable Functions (PUF) for Optical-based Hardware Security Devices

- Increased the size of the PUF's cryptographic key by **100%** (+5 GB/in^2 information density)
- Incorporated thermo-optic heaters to measure active electro-optical PUF reflection signatures
- Created instrumentation to test newly designed silicon photonic active PUF architecture
- **Programs**: Python, MATLAB, Lumerical Interconnect, KLayout Simulation

F. B. Tarik, **D. Joyce Jr**., Y. Lao, and J. D. Ryckman, "Electrically reconfigurable photonic PUF based on a moiré quasicrystal interferometer," in Conference on Lasers and Electro-Optics, Technical Digest Series (Optica Publishing Group, 2022), paper JW3A.30.

PROJECTS

TurtleBot Autonomous Maze Navigation *Aug 2023 – Dec 2023*

- Designed a multimodal state-machine controller to autonomously traverse a custom maze using arrows/street signs
- **Programs:** ROS 2, OpenCV, Gazebo Simulation, Nav2 Navigation Stack

Investigating Neuro-Similarity of Artificial Neural Networks in Continual Learning *Aug 2023 – Dec 2023*

- Employed statistical analysis to compare exemplars generated by the Complementary Learning System's (CLS) model, brain-inspired generative replay model, and a generative classifier
- **Programs:** PyTorch, Go Emergent Framework

Lazy Latte Art: Automated Latte Art Machine *Jan 2023 – May 2023*

- Engineered an automated latte art machine capable of producing heart and snowman art designs for a latte
- **Programs:** Python, PyQT, Kivy **Hardware:** Raspberry Pi 4B, linear actuators, DC servo motors, motor driver

SKILLS

Programming Languages: Python, C++, C, Java, R **Tools:** ROS 2, PyTorch, Jupyter, GIT/GitHub, MATLAB, JIRA, Qt API, NetLogo