GIOVANNI MICHEL

Computer & Electrical Engineer

U.S. Citizen | Willing to relocate

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EDUCATION

Master of Science in Electrical Engineering **Cumulative GPA: 3.5**
Northwestern University, Evanston, IL. Graduation date: June 2025

Master of Science in Artificial Intelligence **Cumulative GPA: 3.8**
Florida Atlantic University, Boca Raton, FL. Graduation date: August 2023

Bachelor of Science in Computer Engineering **Cumulative GPA: 3.4**
Florida Atlantic University, Boca Raton, FL. Graduation date: August 2022

TECHNICAL SKILLS

Programming Languages: C/C++, C#, SQL, HTML, Python, VHDL, SystemVerilog, VLSI, PSpice, JavaScript, CUDA
Tools & Technologies: ROS/ROS2, Cadence Virtuoso, Genus, Quartus, FreeRTOS, Nsight Systems, SLAM
Controllers: TI MSP430, STM32, Raspberry Pi, Nexys4 DDR FPGA, ESP32

EXPERIENCE

Graduate Research Assistant, Los Alamos National Laboratory | Los Alamos, NM **August 2022 – June 2025**

- Spearheaded training framework for porting Reinforcement Learning Q-Learning to a 2-layer spiking neural network. Implemented Neuromorphic Machine Learning simulation for solving cart-pole balancing problem for converging under 200 epochs.
- Researched and engineered spiking-neural networks on the Intel neuromorphic research processor, Loihi. (advisors: Andrew Sornborger, Alpha Renner, and Gerd Kunde).
- Designed learning algorithm for training and validation of spiking neural networks for Reinforcement Learning and Control by implementing SITL framework for interacting with OpenAI Gym.

Software Engineer (Internship), Los Alamos National Laboratory | Los Alamos, NM **May 2022 – August 2022**

- Built the Data Science Infrastructure (DSI) prototype for the Common Model Framework (CMF) – designed a SQL-backed schema that captures simulation, filesystem, and performance metadata, turning multi-day HPC runs into a searchable, permanent knowledge base for analysis and visualization.
- Built a full-stack analytics layer for CMF—authored and optimized backend APIs/SQL for in-database analytics, dataset comparison, and metadata visualizations, and developed interactive browser dashboards (with a parallel-coordinates viewer) that let scientists explore results in real time, eliminating manual post-processing.
- Evaluated GUI front ends and set reproducibility standards – benchmarked ModelDB, Apache Superset, Trame and MLflow, and defined logging of parameters, code versions and environment configs to guarantee experiment repeatability and secure collaboration.

Software Engineer (Internship), GRUBBRR | Boca Raton, FL **September 2021 – February 2022**

- Optimized previous QA processes by 30%, by writing custom Java code to automate red team testing for Android kiosk products which lead to increased efficiency in product testing and design from idea to product releases. Followed CI/CD software development with version control.
- Performed QA automation for unit and functional tests assigned by Project Management, ensuring product quality and reliability.
- Contributed to onsite coordination, progress tracking, planning, closeout, and quality control to support project development.
- Collaborated with client integration teams to engage in insightful discussions. Tracked and raised issues along product life cycle through Jira using Scrum and Agile methodologies.

Relevant Projects

NFC Wireless Temperature Sensor| VLSI Group Project **June 2024**

- Designed schematics for an integrated circuit (IC) to convert analog temperature input into digital output, powered via Near Field Communication (NFC).
- Designed schematics and testbenches for key components, including a temperature sensor, low-dropout regulators, power rectifier, and demodulation rectifier.
- Engineered and validated a power-harvesting component, creating multistage rectifiers integrated with a bandgap reference circuit to generate a stable signal.

4x4 6T SRAM| VLSI Project **March 2024**

- Designed schematics and testbench for a 4x4 6T SRAM array, including sense amplifiers, bit-line pre-charge, and write circuits for each column.
- Created a 6T SRAM layout with dimensions of 1.495µm x 0.3825µm = 0.5718375µm², successfully passing all DRC and LVS tests.
- Developed layouts for the sense amplifier, write circuit, and bit-line pre-charge circuit to ensure functionality and integration.
- Optimized energy consumption, achieving 34.31µW (schematic) and 45µW (layout) for complete read/write operations of the 16-bit SRAM, equivalent to 2.14µW and 2.81µW per single-bit read/write.

Autonomous Robot Manipulator | Senior Design Project **May 2022**

- Integration between Raspberry Pi and Arduino Mega for robotic car and robotic arm that would pick and place water bottles and cans.
- Developed obstacle avoidance and autonomous navigation algorithm using LIDAR, IMU, and ROS for navigating and avoiding obstacles while navigating to user dependent locations.
- Designed C++ code to interact with ROS for closed loop obstacle avoidance for control of robot using ROS markers.

Digilent Nexys 4 DDR FPGA Projects with VHDL | Design of Digital Systems **May 2022**

- Built Register Files with 8 and 16 registers on Xilinx Vivado.
- Built an ALU and a Parameterized Carry Save Multiplier on Xilinx Vivado.
- Built a Vending Machine Subsystem using a Finite State Machine and Arithmetic State Machine on Xilinx Vivado.
- Conducted research for different ASICs, FPGAs, BIST, Timing Analysis, and Critical Path related to VHDL FPGA design.

Leadership

VP Society of Hispanic Professional Engineers (SHPE) | FAU **August 2022 – May 2023**

Marketing Chair Machine Perception Cognition Robotics Lab (MPCR) | FAU **August 2022 – May 2023**

PUBLICATIONS

- **Michel, G**., Nesbit, S., Sornborger, A. (2024, December). Closed-loop Q-learning Control with Spiking Neuromorphic Network. LA-UR-24-32562. Association for Computing Machinery. **Paper**.
- **Michel, G**., Renner, A., Kunde, G., Sornborger, A. (2023, August). Towards Q-Learning-based control using a spiking neuromorphic network and sparse encoding. LA-UR-23-283336. Association for Computing Machinery. **Poster.**
- **Michel, G**., Pulido, J., Turton, T. (2022, August). Database Visualization for the Data Science Infrastructure Project. **Poster.**

ACHIEVEMENTS

Dean's List College of Computer Science and Engineering | Florida Atlantic University **Spring 2023**

GEM Employer Master's Fellowship | Northwestern University **May 2023**

- Awarded by the National Consortium for Graduate Degrees in Engineering and Science (GEM).
- Sponsored by Los Alamos National Laboratory, covering full tuition and providing a stipend for a master's degree in electrical engineering.

NSF NRT Fellowship | Florida Atlantic University **Spring 2022**

- Awarded by the National Science Foundation for graduate studies in Data Science and Artificial Intelligence.
- Chosen as one of eight students from the entire engineering department for the 2022–2023 cohort.