GIOVANNI MICHEL

Electrical Engineering

Evanston, IL 60201
geo4581@gmail.com
561.480.1950
www.linkedin.com/in/giovanni-michel

Education

Master of Science in Electrical Engineering **Cumulative GPA: 3.4**
Northwestern University, Evanston, IL. Graduation date: May 2025

Master of Science in Artificial Intelligence **Cumulative GPA: 3.7**
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#, MATLAB, Simulink, HTML, Python, VHDL and Verilog, VLSI, PSPICE, JavaScript, Quartus

Skills & Technologies: ROS, Microsoft Office Suite (Word, Excel, PowerPoint), Oscilloscopes, DMM, Soldering, PCB Design, Linux, Virtuoso

Controllers: TI MSP430, ARM Cortex-M3, Raspberry Pi, Nexys4 DDR FPGA, Intel Loihi

Professional Experience

Graduate Research Assistant, Los Alamos National Laboratory | Los Alamos, NM **April 2022 – Present Day**

Engage in research, design and development for Spiking Neural Networks (SNNs) using the Intel neuromorphic research processor, Loihi.

- Implemented Q-learning using neuromorphic translatable design methods, this resulted in solving the cartpole problem with a mean average score of 200 over 200 episodes. Designed an information processing circuit out of SNNs to control information in neuronal circuit.
- Designed and implemented encoding methods for representing cartpole dynamics to be used as input to 2-layer SNN that ran on Loihi. This resulted in a poster and paper publication at two conferences.

Graduate Research Assistant, Grayson Group| Evanston, IL **December 2023 – Present Day**

Made experiments to model dynamics of different electronic devices at cryogenic temperatures down to 1.5K.

- Designed experiments to model signal stability and temperature dependence for VCOs by modeling modified Allan variance, power spectral density, and phase noise.
- Designed experiments to model the temperature dependence for the voltage threshold, Fermi energy, leakage current, and insulator capacitance**.**

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

Responsible for performing Q&A automation duties for unit test and functional test assigned by Project Management.

- Implemented standardized processes for Q&A group, which lead to efficient product testing for and design of end-to-end product release.
- Engage in onsite coordination, progress, planning, closeout, & quality control to add support to project development.
- Led teams for client integrations using technical communications skills, Scrum, and Agile methodologies.

Publications

- **Michel, G**., Nesbit, S., Sornborger, A. (2024, December). Closed-loop Q-learning Control with Spiking Neuromorphic Network. LA-UR-24-32562
- **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
- **Michel, G**., Pulido, J., Turton, T. (2022, August). Database Visualization for the Data Science Infrastructure Project

Relevant Projects

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

- Designed schematics of an IC that converts an analog input (temperature) into a digital output using Near Field Communication (NFC), to power the circuit.
- Designed schematic and testbench for temperature sensor, low-dropout regulators, power rectifier, and demodulation rectifier.
- Designed and tested power harvesting component, made multistage rectifiers that worked with bandgap reference circuit to generate stable signal.
- This resulted in learning about RC response, impedance matching, and designing an ADC.

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

- Designed schematics and testbench for 4x4 6T SRAM Array with Sense Amplifier, bitline precharge and write circuits for each column.
- Designed layout for 6T SRAM with dimensions 1.495um x 0.3825um = 0.5718375um^2. This passed all DRC and LVS test.
- Designed layout for sense amplifier, write circuit, precharging circuit.
- The energy consumption: 34.31uW (schematic) and 45uW (layout) for the entire writing and reading of the 16bit SRAM. Divided down, for one single bit read/write it consumes 2.14uW and 2.81uW.

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.
- Create an innovative & responsive solar tracker using linear actuators for position optimization for solar panel sunlight exposure.

Leadership

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

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