

Thomas Twomey

Ann Arbor, MI | ttwomey@umich.edu

EDUCATION

University of Michigan

Computer Science and Engineering, PhD program
Advisor: George Tzimpragos

Ann Arbor, MI
Aug. 2023 – Current

Virginia Tech

College of Engineering, Bachelor of Science in Computer Science
College of Science, Bachelor of Arts in Economics
Graduated Summa Cum Laude, Cumulative GPA: 3.95/4.00

Blacksburg, VA
Aug. 2017 – Dec. 2020

CURRENT PROJECTS

In-Sensor Computing with Temporal Logic

Sep. 2023 – Current
Ann Arbor, MI

Advised by George Tzimpragos

- Exploring the use of temporal logic (a scheme where information is represented as a timing delay) to perform compute in-sensor quickly and efficiently to reduce downstream communication costs.
- Simulating modifications to visual Simultaneous Localization And Mapping (SLAM) and Optical Flow pipelines with race logic components.
- Designing CMOS image sensor with temporal feature identification and tracking.

RESEARCH ARTIFACTS

On the Characterization of the Performance-Productivity Gap for FPGA

IEEE International High-Performance Extreme Computing (HPEC) Conference, September 2022

Deep Learning Architectures for FSCV, a Comparison

Preprint, <https://arxiv.org/abs/2212.01960>

PAST RESEARCH EXPERIENCE

Scientific Programmer / Data Analyst

June 2021 – May 2023
Roanoke, VA

Montague Lab : Fralin Biomedical Research Institute at Virginia Tech Carillon

- Developed, tested, and deployed machine learning models for prediction of in-vivo neurotransmitter concentrations
- Implemented and maintained automated in-vitro and in-vivo data processing pipelines for prediction, visualization, and validation purposes
- Developed software techniques to identify, quantify and suppress electrical noise from low amplitude voltammetry recordings
- Designed automated/robotic in-vitro data collection apparatus to increase data collection throughput by an order of magnitude and to increase quality of the data

Undergraduate Research Assistant

Feb. 2020 – Dec. 2020
Blacksburg, VA

SyNeRGy Lab : Virginia Tech Department of Computer Science

- Developed High Level Synthesis and Register Transfer Language implementations of computing kernels (Sobel Filter, K-means clustering, FFT) for quantification of performance / productivity trade-off

Volunteer Research Assistant

Aug. 2020 – Dec. 2020
Blacksburg, VA

Dr. Yang Yi's Lab, Virginia Tech Department of Electrical and Computer Engineering

- Assisted with investigation of Spiking Neural Networks (SNN) for FPGA
- Performed cursory literature survey of existing SNN architectures and hardware implementations
- Conducted limited simulation of SNN models with PyTorch based library

Volunteer Research Assistant

Feb. 2019 – May 2019
Blacksburg, VA

Virginia Tech Department of Economics

- Assisted with behavioral economics risk perception experiment
- Developed oTree(Django derivative) based web app for a behavioral economics experiment

TEACHING EXPERIENCE

Undergraduate Teaching Assistant

Jan. 2019 – May 2019

Virginia Tech Department of Computer Science

Blacksburg, VA

- Guided ~ 100 students on projects related to Linux Environments, C programming, and x86 Assembly
- Provided extensive help debugging student code and promoted simple debugging techniques