

Timothy J Scholtz

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Education

Bachelor of Science: Computer Engineering, University at Buffalo – Member of Honors College

Start Date: August 2021

Expected Graduation Date: May 2025

GPA: 3.8

Research Experiences

Location: School of Engineering – University at Buffalo

Date: 2023 April – 2023 August

Title: Research Assistant

Principal Investigator: Dr. Wenyao Xu

Research Project: Developing an automated speech recording and analysis tool:

- Integrated and modified multiple speech-to-text tools into a single program and developed a sentence-combining algorithm to increase accuracy. Conducted testing, experimented with various microphones and mm-wave recorders, and the created a pipeline to combine several inputs into a single output.
- Performed a comparison study between the accuracy of cutting-edge tools, as well as our own, and found that our tool was able to improve the Word Error Rate by 5%. Also conducted a study to determine how different recording devices affected the accuracy of the speech-to-text.
- Appointed to lead weekly meetings where we exchanged ideas and tracked progress and was also was nominated to present the work on behalf of our team to the entire department. This project enhanced my skills in data analysis, problem-solving, teamwork, large dataset handling, and software development.

Location: School of Computer Science – University at Buffalo

Date: 2021 December – 2022 August

Title: Research Assistant

Principal Investigator: Dr. Weihang Wang

Research Project: Automated Detection of Compilation Differences Between Compilers

- Developed a differential software testing framework to analyze compilation differences between 2 compilers. My framework accepted any software as input, compiled it using the 2 compilers, and compared their behavioral output during execution. Additionally, it could insert hooks to help monitor their behavior.
- Tested this framework using GCC and Emscripten and was able to pinpoint inconsistencies and failures in 7% of the input software. I inspected each of the failures, and categorized them into: long type memory allocation, static memory address allocation, array overflow, and modifying read-only data.
- Learned how to solve problems independently, gained proficiency in addressing open-ended challenges, and gained experience in the research process and academic writing.

Work Experiences

- **Teaching Assistant:** 2023 September – Current

Worked as a teaching assistant in an introductory computer science class, ran labs, and graded papers.

- **Tutor:** 2023 February – May

Tutored both individuals and groups in physics, math, and computer science.

- **Gravatronics:** 2021 January – April

Interned at a startup company focused on developing battery management systems. Assisted with writing data analysis scripts, prototyping circuits, organizing inventory, and writing documentation.

Projects

Memory Manager: C, Unix, Memory – Built a dynamic memory allocator supporting small applications.

Cedar tools: Flask, CSS, JS – Created and hosted website cedar-tools.com which provides simple dev tools

Clubs and Volunteering

SPCA Severing Erie County – Volunteer on a weekly basis, helping with organization and sorting

Ark Animal Shelter - Over the course of two weeks, I helped with caring for the dogs in a no-kill shelter.

STEM Field Trips - Helped run UB's hosted STEM field trip, introducing 8th graders to STEM careers.

IEEE Battlebots – Part of a team that designs and builds battles bots to complete in local competitions.

Tau Beta Pi – Active member of engineering honor society

Skills

Programming Languages: Python, C, Verilog, Bash, Scala, Java, GDscript, Mips, SQL, Arm Assembly

Tools: LaTeX, Arduino, Audio Processing, Unix, MySQL, Linux, Microsoft Office tools, Git, Visual Studio

Soft Skills: Problem Solving, Analytical, Dependability, Communication, Organization, Debugging, Self-starter

Equipment: Oscilloscope, Soldering, Microcontrollers, Test Equipment, LTspice