Drew Zagieboylo

Assistant Teaching Professor

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Current Employment

2023-Present **Assistant Teaching Professor**, *Department of Electrical and Computer Engineering*, Northeastern University.

Serving as instructor for several sophomore-level courses focused on: **Introductory Programming**, **Embedded Design**, and **Fundamentals of Digital Design**. Responsibilities include: preparing lectures and assignments that promote active learning in the classroom; preparing take-home assignments, projects, and exams; providing both summative and formative feedback on student work; updating the hardware and software for embedded design labs; and classroom/course/course staff management.

Peer-Reviewed Publications

All of the following are first-author publications.

CCS - 2023 **SpecVerilog: Adapting Information Flow Control for Secure Speculation**. Published and presented at the 30th Conference on Computer and Communications Security - **Recipient of Distinguished Paper Award**

PLDI - 2022 **PDL: A High-Level Hardware Design Language for Pipelined Processors**. Published at the 43rd ACM SIGPLAN Conference on Programming Language Design and Implementation.

CSF - 2019 **Using Information Flow Control to Design an ISA that Controls Timing Channels**. Published and presented at the 32nd IEEE Computer Security Foundations Symposium.

ICPE - 2017 **Cost-Efficient and Reliable Reporting of Highly Bursty Video Game Crash Data**. Published and presented at the 8th ACM/SPEC International Conference on Performance Engineering.

Teaching Experience

Fall 2022 **TA - Instructor**, *Computer System Organization & Programming*, Cornell University.

Performed the role of a co-instructor for this 350-student course with Professor Anne Bracy. I am responsible for assisting with all of the following tasks: giving lectures; assisting in policy decisions; managing course staff; (re)designing assignments; writing exams; grading assignments; holding office hours; and, maintaining our course electronic resources (such as Canvas, and EdStem).

Spring 2022 **Participant**, *Teaching and Learning Graduate Seminar*, Cornell University.

Participated in a semester long course designed to introduce graduate students to learning theory and pedagogy, as well as prepare them for academic teaching positions. In this seminar we: discussed and presented research on teaching and learning (especially in the undergraduate setting); prepared sample lesson plans and course syllabi; gave feedback to my peers on their work; and, completed a teaching demonstration.

Other Research and Publications

Virtual Memory - 2020	**The Cost of Software-Based Memory Management Without Virtual Memory** In this report I analyzed the potential benefits of removing the virtual memory abstraction in terms of performance and complexity. I made the case that, with only limited hardware support, operating systems and language runtimes can implement the features of virtual memory, and program performance would benefit from elimination of address translation overhead. *ArXiv Report Available.*
JLang - 2018-2019	**An ahead-of-time compiler for Java programs, targeting LLVM**. I contributed primarily to the JVM run-time implementation for JLang, as well as the implementation of reflection, and code generation. I also mentored an undergraduate student who implemented the Java Thread API to support concurrency for JLang.
Swarm Coordination - 2018	**To Centralize or Not to Centralize: A Tale of Swarm Coordination**. I built a python-based simulator to analyze the performance characteristics of different scheduling models of drone swarm tasks. I helped study the trade-offs between drone power consumption, task completion times, and scheduling latency in centralized compared to decentralized schedulers. *ArXiv Report Available.*
DRAM Scheduling - 2014	**Analysis of Memory Controller Scheduling Policies on the Raven Mobile Microprocessor**. In this work for a graduate computer architecture course, I analyzed the impact of common DRAM request scheduling algorithms on average memory latency in the context of a working mobile processor using hardware simulation.

Education

2017–2023	**PhD**, *Cornell University*, Ithaca, NY, *Computer Science*. Dissertation: *LANGUAGE–BASED TECHNIQUES FOR BUILDING TIMING CHANNEL SECURE HARDWARE–SOFTWARE SYSTEMS*
2020	**Master's**, *Cornell University*, Ithaca, NY, *Computer Science*. Designing and Programming Secure Hardware
2010–2014	**Bachelor's**, *University of California - Berkeley*, Berkeley, CA., *Computer Science*. Distinction in General Scholarship. **GPA: 3.812/4.0**

Industry Experience

2014–2017	**Software Engineer**, *Data Platform Infrastructure*, Electronic Arts, CA. Developed and benchmarked various distributed big data applications running on AWS cloud infrastructure, worked with open source big data technologies such as Hadoop, Kafka, and Storm, was primarily responsible for maintaining and re-architecting EA's central game crash reporting service, and created code to automate various cloud requirements such as dynamic application deployment and monitoring.
Jun–Aug 2013	**Software Development Intern**, *Tibco Streambase*, MA. Built a multicast-based managment tool for real time event processing software and debugged performance issues caused by memory leaks and unnecessary java object creation.
Jun–Aug 2012	**Software Development Intern**, *Coosmic Corp.*, CA. Built the backend for a content aggregation web application, working with MySQL and Neo4j.

Scholarships and Recognition

2019	National Defense Science & Engineering Graduate Fellowship (**NDSEG**) winner.
2016	GRE®: 337 (q:170;v:167) (97th ;98th percentile); aw: 6.0/6.0 (99 percentile)
2012	Member of Upsilon Pi Epsilon Honor Society for Computer Science
2010	National Merit Scholar Recipient

Volunteering

2019	**Expand Your Horizons Instructor**, *Cornell Univeristy*.
	Co-taught a program targeted at introducing middle school girls to STEM fields.
2016–2017	**Volunteer Computer Science Instructor**, *Hillsdale High School*, San Mateo, CA.
	Worked as an instructor for an AP CS class via the TEALS program by creating and delivering lesson plans and giving feedback on assigned material

Programming Tool Proficiencies

Basic:	Javascript/Typescript, React, HTML, Vivado HLS
High:	C, C++, LLVM, Chisel, MySQL
Expert:	Java, Scala, Python, Bluespec System Verilog, Verilog, Bash, Hadoop, Kafka, Amazon Web Services

Languages

English	Native Speaker
French	Conversational Ability