Zachary Yedidia

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zyedidia.github.io, github.com/zyedidia

Education

Stanford University — Stanford, CA

Ph.D. student in Computer Science — *Sep. 2021 –*

Advisors: Prof. David Mazières and Prof. Dawson Engler

Coursework:

- Formal Methods for Computer Systems (CS357s)
- Design Projects in VLSI Systems I (EE272)
- Advanced Systems Laboratory I (CS240LX)
- Advanced Systems Laboratory II (CS340LX)

Harvard University — Cambridge, MA

S.M. in Computer Science — *Sep. 2020 – May 2021*

Harvard College — Cambridge, MA

A.B. Magna cum laude with highest honors in Computer Science — *Aug. 2017 – May 2021*

Selected coursework:

- Programming Languages (CS152)
- Research Topics in Operating Systems (CS261)
- Systems Security (CS263)
- Computational Linguistics and NLP (CS187)
- Research Topics in Computer Architecture (CS247r)
- Big Data Systems (CS265)
- Advanced Computer Architecture (CS246)
- Special Topics in Edge Computing (CS249r)
- Probabilistic Analysis and Algorithms (CS223)
- Data Systems (CS165)
- Data Structures and Algorithms (CS124)
- Computational Neuroscience (MCB131)
- Electromagnetism and Statistical Physics (Physics15b)
- Compilers (CS153)
- Theory of Computation (CS121)
- Optimization: Methods and Models (AM121)
- Circuits, Devices, and Transduction (ES152)
- Operating Systems (CS161)
- Design of VLSI Circuits and Systems (CS148)
- Systems Programming and Machine Org. (CS61)
- Computing Hardware (CS141)
- Mathematical logic (Phil140)

Publications

Zachary Yedidia and Stephen Chong. "Fast Incremental PEG Parsing" (2021). Proceedings of the 14th ACM SIGPLAN International Conference on Software Language Engineering (SLE), October 2021. **Best paper award**. PDF, Slides.

Maximilian Lam, Zachary Yedidia, Colby Banbury, Vijay Janapa Reddi. "Precision Batching: Bitserial Decomposition for Efficient Neural Network Inference on GPUs" (2021). Proceedings of the 30th International Conference on Parallel Architectures and Compilation Techniques (PACT), September 2021. PDF.

Writing

Zachary Yedidia. "Incremental PEG Parsing" (2021). Senior thesis, advised by Prof. Stephen Chong. PDF.

Zachary Yedidia, "SystemVerilog Guide." Course materials for CS 141 (Spring 2020) at Harvard. PDF.

Awards

NSF Graduate Research Fellowship (2022).

Open Source Projects

Micro Text Editor — Website, GitHub Project

I created and launched a text editor called Micro in April 2016. Micro is a project with over 19,000 stars on GitHub, more than 500,000 downloads, and 100+ contributors. It aims to be a successor to Nano as a simple to use terminal-based text editor. Micro was the subject of multiple news articles and has been featured on the

front page of Hacker news multiple times. Micro is available in many package managers such as: Homebrew, Apt, Snap, AUR, Chocolatey and more.

GPeg Publication, Thesis, Slides, GitHub Project

Library for PEG parsing, as part of my senior thesis research with Professor Stephen Chong. GPeg uses a parsing virtual machine for dynamic parser generation, and implements a novel algorithm for efficient incremental parsing. Additionally includes a library for syntax highlighting: github.com/zyedidia/flare.

Knit GitHub Project

A flexible build tool that combines Lua with Make's declarative rules language.

Perforator GitHub Project

Perforator is a `ptrace`-based tool for recording Linux "perf" metrics like cache misses, branch mispredictions, CPU cycles, for certain parts of a program like functions or source code regions (as opposed to `perf stat` which only records over entire program lifetimes).

Literate Programming Tool Website, GitHub Project

A tool for compiling Literate programs written in any programming language. Featured on the front page of Hacker News in September 2015. The article "Write your Own Virtual Machine" was written using Literate.

Eget GitHub Project

A tool for automatically installing pre-built binaries distributed in GitHub releases.

Go Generic Data Structures Github Project

A library of generic data structures for Go.

RISC-V collection In progress

Including: a pipelined rv32 core written in Chisel (running on open-source FPGAs), a RISC-V symbolic execution engine, and a toy RISC-V assembler.

Service

External reviewer for ACM TOPLAS.

Experience

SiFive San Mateo, CA
Chisel Team Intern *Summer 2022*

Zero ASIC Virtual
Intern *Summer 2021*

Harvard University Cambridge, MA
HCRP Research Fellow (Advisor: Prof. Stratos Idreos) *Summer 2020*

Raytheon Company Tucson, AZ
Internal Research and Development Intern *July – August Summer 2019*
Advanced Missile Systems

Princeton University Princeton, NJ
Research Assistant (Advisor: Prof. Naveen Verma) *May – June Summer 2019*

Harvard University Cambridge, MA
PRISE Research Fellow (Advisor: Prof. Eddie Kohler) *Summer 2018*

Teaching

Using Bits to Control Atoms (CS49n) Stanford
Course Assistant for Prof. Dawson Engler *Autumn 2021*

- Helped with a lab-based introductory seminar on bare-metal Raspberry Pi programming.

Systems Programming and Machine Organization (CS61) Harvard
Teaching Fellow for Profs Eddie Kohler and Minlan Yu *Fall 2020*

- Teaching evaluations: 4.9/5.0, Derek Bok Center teaching award.

Computing Hardware (CS141) Harvard
Teaching Fellow for Profs David Brooks and Vijay Reddi *Spring 2019, Spring 2020*

- Revamped course materials with new FPGA boards and tools (updating to Xilinx Vivado and SystemVerilog).
- Teaching evaluations: 4.8/5.0, Derek Bok Center teaching award (2019). No evaluations in 2020 due to COVID.

Compilers (CS153) Harvard
Teaching Fellow for Prof. Stephen Chong *Fall 2019*

- Teaching evaluations: 5.0/5.0.

Programming Skills

Primary Interests:	Computer Systems, Hardware/Architecture, Compilers.
Languages:	Go, C/C++, D, Chisel/Scala, SystemVerilog, Python, Java, OCaml, Lua.
Tools:	Vim, Git, Yosys, Verilator, Xilinx Vivado, LaTeX.