Zachary Yedidia

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Education

Stanford University — Stanford, CA
Incoming Ph.D. candidate in Computer Science — *Sep. 2021 –*

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)
- Senior Thesis Research (CS91r)
- Research Topics in Computer Architecture (CS247r)
- Big Data Systems (CS265)
- Introduction to Semantics (Ling106)
- 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)
- Discrete Mathematics (CS20)
- Systems Programming and Machine Org. (CS61)
- Computing Hardware (CS141)
- Scientific Computing (AM111)
- Mathematical logic (Phil140)
- Linear Algebra and Differential Equations (Math21b)

Concord Academy — Concord, MA
High school — *Sept. 2013 – June 2017*

Writing

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

Maximilian Lam, Zachary Yedidia, Colby Banbury, Vijay Janapa Reddi. "Quantized Neural Network Inference with Precision Batching" (2020). Link.

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

Open Source Projects

Micro Text Editor — Website, GitHub Project

I created and launched a text editor called Micro in April 2016. Micro is a Go project with over 17,000 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 (for Ubuntu Focal and Debian Buster), Snap, AUR, Chocolatey and more.

GPeg — GitHub Project

In-progress 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.

Perforator GitHub Project

Perforator is a tool for recording Linux "perf" metrics like cache misses, branch mispredictions, CPU cycles, etc... for certain parts of a program like functions or source code regions (as opposed to `perf stat` which only records over entire program lifetimes). It works by using `ptrace` and inserting software breakpoints to enable and disable profiling (Perforator reads the ELF symbol table and possibly DWARF debugging information to determine where to place breakpoints). Perforator supports position-independent ELF executables and multithreaded programs (with limitations).

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. Link.

SFML.jl, Chipmunk.jl Talk, GitHub Project

Graphics and physics libraries presented at JuliaCon 2015 at MIT.

Experience

Harvard University Cambridge, MA

HCRP Research Fellow (Advisor: Prof. Stratos Idreos) *Summer 2020*

- Worked on a project for improving hash function performance for use in database hashtables and filters, implementing the novel technique in state-of-the-art hashtables/filters for benchmarking and analysis.

Raytheon Company Tucson, AZ

Internal Research and Development Intern *July – August Summer 2019*

Advanced Missile Systems

- Worked on a research project in DARPA's Electronics Resurgence Initiative (ERI).

Princeton University Princeton, NJ

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

- Wrote software for a state-of-the-art in-memory computing ASIC using mixed-signal SRAM technology.
- Mapped applications to the hardware including signal processing and machine learning applications.
- Characterized and benchmarked performance and noise.

Harvard University Cambridge, MA

PRISE Research Fellow (Advisor: Prof. Eddie Kohler) *Summer 2018*

- Worked on the C++ transactional memory system (called STO) developed by Professor Eddie Kohler's computer systems research group, implementing and benchmarking a transactional Adaptive Radix Tree that outperformed the existing transactional Masstree.

Teaching

Systems Programming and Machine Organization (CS61)

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)

Teaching Fellow for Profs David Brooks and Vijay Reddi *Spring 2019, Spring 2020*

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

Compilers (CS153)

Teaching Fellow for Prof. Stephen Chong *Fall 2019*

- Teaching evaluations: 5.0/5.0.

Programming Skills

Primary Interests:	Computer Systems, Hardware/Architecture, Compilers.
Languages:	C/C++, Go, SystemVerilog, Python, Java, D, OCaml, Matlab, Julia, Lua, Perl.
Tools:	Vim, Git, Xilinx Vivado, PyTorch, LaTeX.