

DONALD PINCKNEY

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SKILLS

Languages: Rust, Python, JavaScript/TypeScript, SQL, C/C++, Swift, Haskell, Go, OCaml.

Tools: Docker, PostgreSQL, AWS, serverless computing (Lambda), CI/CD, React, CouchDB, Redis.

Specialties: building agentic systems, code-assistant agents, enterprise AI integrations, developer tooling / program analysis, dependency / package management, serverless computing, compilers, formal verification, distributed systems, high-performance computing

EXPERIENCE

Gitar (venture-backed startup, [gitar.ai](#)), *Founding AI Engineer*

Apr 2024 – Present

- Launched [Jimmy](#), the first AI coding agent leveraging deep static analysis, driving a 700% spike in **enterprise customer acquisition**.
- Spearhead integration of **core compiler algorithms** with **generative AI** to enhance code understanding and automate enterprise-scale refactors.
- Collaborate hands-on with **enterprise customers**, including multiple Fortune 500s, to dig into their specific needs, understand integration challenges, and develop engineering and communication plans to drive projects from initial discovery to deal close.
- Architected and implemented static analysis driven refactoring pipelines for enterprise clients, significantly streamlining large-scale code maintenance.
- Designed an automated test-generation framework for static analyses, catching critical bugs before release and preventing sending faulty pull requests to enterprise clients.

Northeastern University, Programming Research Lab, *PhD*

Sep 2020 – Nov 2024

- Built a new generation of **intelligent package managers** for JavaScript and Python based on combining **foundational constraint solving algorithms** with **generative AI** to automatically fix common developer issues, such as solving runtime errors, patching security vulnerabilities and reducing code size.
- Supervised and guided an undergraduate student in building a **distributed system** using **relational databases** and **container orchestration** to archive every **NPM** package (over 36 million, 20+ TB) with low-latency (< 1 min) within a large (50,000 CPU core) **high-performance computing** (HPC) cluster.
- Developed a novel methodology (MultiPL-E) to standardize the **evaluation of large language model (LLM) code generation** across 19 programming languages, which is used extensively by researchers at **Hugging Face**, ServiceNow, IBM Research and SAP.

Draper Laboratory, *Research Scientist Intern*

Feb 2023 – May 2023

- Contributed to enhancing national security by participating in a **DARPA-funded** defensive **cybersecurity** research program ([AMP](#)) automatically verifying correctness of **binary security patches**.

Uber, Programming Systems Group, *Programming Systems Research Intern*

May 2020 – Dec 2020

- Designed **dynamic analysis**-based tooling informed by **natural language processing** of crash logs that was used in a company-wide effort to repair over 75% of flaky tests, significantly reducing **CI** backlogs.

University of Massachusetts Amherst, *MS*

Sep 2018 – May 2020

- Pioneered the study of **formal semantics** for **serverless computing** (FaaS), laying a theoretical foundation for cloud providers to develop new FaaS abstractions, such as [Microsoft Azure's Durable Functions](#).
- Reduced code size by 23% and sped up programs by 15% for multithreaded **WebAssembly** by extending a **JIT compiler** (Wasmtime) with stack capture instructions in assembly.

Apple Inc., macOS Frameworks Team, *Intern*

Jun 2016 – Aug 2016

- Created a [new user-interface feature](#) simplifying tab navigation in the native macOS UI framework (AppKit), and perfected reliability of it across first-party and third-party apps so it could ship in **macOS High Sierra**.
- Presented the feature before a distinguished panel, including Apple's Senior Vice President Craig Federighi, earning recognition as one of the **top 10 intern projects** from a pool of hundreds of competitors.

EDUCATION

Northeastern University, PhD in Computer Science

Sep 2020 – Nov 2024

Focused on Programming Languages, GPA: 4.00, Advised by Drs. Arjun Guha and Jonathan Bell

University of Massachusetts Amherst, MS in Computer Science

Sep 2018 – May 2020

Focused on Programming Languages, GPA: 3.87, Advised by Drs. Arjun Guha and Yuriy Brun

University of California Davis, BS in Computer Science and Mathematics

Sep 2014 – Jun 2018

Double Major in Computer Science & Engineering and Mathematics, GPA: 3.94

LEADERSHIP AND INVOLVEMENT

Northeastern University CS2500, *Head Teaching Assistant*

Jul 2021 – Dec 2021

- Developed homework assignments that guided students through a learning experience focusing on the fundamental principles of **datatype design** and **functional programming**.
- Managed a team of 100+ TAs to efficiently grade over 1000 assignments weekly while orchestrating engaging office hours to foster student participation and learning.

Citrus Circuits FIRST Robotics Team, *Team Mentor*

Jul 2014 – May 2015

- Coached the team to win the **FRC World Championship** for the first time in 2015, and spearheaded the development of advanced statistical methods for optimizing robot draft selection.
- Created an innovative **iOS development-based curriculum** to onboard new students interested in programming to the robotics team, which substantially increased student enrollment and engagement.

PUBLICATIONS

ICSE 2023 *Flexible and Optimal Dependency Management via Max-SMT*. **Donald Pinckney**, Federico Cassano, Arjun Guha, Jonathan Bell, Massimiliano Culp, Todd Gamblin. [\[paper\]](#) [\[talk\]](#) [\[github\]](#) [\[install\]](#)

MSR 2023 *A Large Scale Analysis of Semantic Versioning in NPM*. **Donald Pinckney**, Federico Cassano, Arjun Guha, Jonathan Bell. [\[paper\]](#)

ESEC/FSE 2023 Demo Track *npm-follower: A Complete Dataset Tracking the NPM Ecosystem*. **Donald Pinckney**, Federico Cassano, Arjun Guha, Jonathan Bell. [\[paper\]](#) [\[talk\]](#) [\[dataset\]](#) [\[github\]](#)

TSE 2023 *MultiPL-E: A Scalable and Polyglot Approach to Benchmarking Neural Code Generation*. Federico Cassano, John Gouwar, Daniel Nguyen, Sydney Nguyen, Luna Phipps-Costin, **Donald Pinckney**, Ming-Ho Yee, Yangtian Zi, Carolyn Jane Anderson, Molly Q Feldman, Arjun Guha, Michael Greenberg, Abhinav Jangda. [\[paper\]](#) [\[talk\]](#) [\[github\]](#) [\[website\]](#)

DLS 2020 *Wasm/k: Delimited Continuations for WebAssembly*. **Donald Pinckney**, Yuriy Brun, Arjun Guha. [\[paper\]](#) [\[talk\]](#) [\[github\]](#) [\[website\]](#)

OOPSLA 2019, Distinguished Paper Award *Formal Foundations of Serverless Computing*. Abhinav Jangda, **Donald Pinckney**, Yuriy Brun, Arjun Guha. [\[paper\]](#) [\[talk\]](#) [\[website\]](#)