

# Caner Derici, PhD

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[extended version](#)

## Technical Skills

**Areas of Expertise:** Compilers & Programming Languages · Distributed Systems · Machine Learning

**Languages:** Go · C++ · Python · Racket/Scheme · LLVM · Java · SQL · JavaScript

**Cloud:** Kubernetes · AWS · GCE · Terraform · LXD · Docker

**Workflows & Productivity:** Linux · Neovim · VSCode · Copilot · ChatGPT · Git · GH Actions · Obsidian · Toggl · Todoist

**API, DB & Misc:** REST · gRPC · OpenAPI · FastAPI · DQLite · MongoDB · PostgreSQL · CI/CD · Jenkins

## Education

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|---|-------------|
| Ph.D., <a href="#">Indiana University, Bloomington</a> , Computer Science, Compilers & Programming Languages  | 2015 – 2025 |
| Dissertation: Self-Hosting Functional Programming Languages on Meta-Tracing JIT Compilers                     |             |
| M.Sc., <a href="#">Boğaziçi University</a> , Computer Science, Machine Learning & Natural Language Processing | 2012 – 2014 |
| B.Sc., <a href="#">Bilgi University</a> , Computer Science  | 2005 – 2010 |

## Experience

Canonical USA

REMOTE, US

**SWE II (L4 - IC3) · Distributed orchestration at scale**

2021 – 2024

- Developed and maintained [Juju](#), an eventually consistent distributed orchestration system used by ~200 companies globally, capable of handling 1000+-node workloads with 99.9% availability on any infrastructure (Kubernetes or otherwise) across various cloud providers (e.g., AWS, GCE). All in Go.
- Improved reliability and fault tolerance by implementing edge machine services on relational DQLite back-end, migrating from NoSQL MongoDB (e.g., [sample PR](#)).
- Owned client libraries for three years—[python-libjuju](#), [Terraform Juju Provider](#); doubled active users and maintained a steady release cadence.
- Took part in roadmap planning, coordinated cross-team work; mentored junior engineers, and improved hiring by creating a structured bootcamp process that cut down onboarding new engineers from 6 months to 1 month.

Indiana University

IN, US

**Research Assistant, Course Instructor**

2015 – 2021

- Independently took an ambiguous, uncharted compiler problem to a working product; built the first-ever tracing JIT compiler that is a full-scale runtime for a self-hosting, production-grade language. Conducted a full performance investigation and designed new optimization algorithms (see [PhD dissertation](#)).
- Taught data structures & algorithms, compilers, virtual machines, and domain specific languages.

Asseco SEE Group

2010-2012

**Software Engineer**

- International software company developing virtual payment systems for e-commerce platforms. I developed and delivered 3 virtual point-of-sale projects in 2 years. Used Java, Apache Tomcat, Spring, Mercurial, Jira.

## Selected Projects

**Pycket: A tracing JIT compiler for full-scale Racket**

Developed and maintained [for over five years](#). Designed the compiler to self-host a language on a meta-tracing JIT backend. Contributed designing a new IR (see publications). Built [performance analysis tools](#), run-time optimizations, and [formalisms](#) to improve performance. Implemented code-gen for full FFI layer, and engines with meta-continuations for preemption for green threads. In Python, C, and Racket.

**Rax: A full-stack nanopass compiler from Racket to x86\_64**

Implemented all the passes (e.g., closure conversion, register allocation, code-gen, etc.), along with garbage collection. Developed optimizations, such as inlining, loop-invariant code motion, and proper tail-calls. In Racket, and C.

**FARS: Functional Automated Reasoning System**

A resolution/refutation theorem prover, for expressions in first-order predicate logic with equality. Used binary paramodulation, and forward and backward subsumption for equational deduction. In Racket.

**HazirCevap (Witty): A closed domain question answering system for high school students**

Government funded large scale question answering system. M.Sc. thesis on NLP. Led the R&D team (3 faculties, 4 grad students). Developed a Hidden Markov Random Field model for question analysis, and relevance metrics for information retrieval and response generation (see publications). In Python, and JavaScript.

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## **Selected Publications**

- Flatt M., Derici C. Dybvig R. K., Keep A. et. al. "Rebuilding racket on chez scheme (experience report)", ICFP'19
  - Derici C. et. al. "A closed-domain question answering framework using reliable resources to assist students" Natural Language Engineering'18
  - Derici C. et. al. "Question analysis for a closed domain question answering system", CICLING'15
  - Derici C. et. al. "Rule-based focus extraction in Turkish question answering systems", SIU'14
  - Başar R. E., Derici C., and Şenol Ç. "World With Web: A compiler from world applications to JavaScript". Technical Report, Scheme and Functional Programming Workshop'09
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## **Awards & Scholarships**

- Scholarship and award for a project on teaching natural languages to hearing impaired, 2014.
  - Full Scholarship for PhD, 2015-2020
  - Full Scholarship for MSc, 2012
  - Full Scholarship for BSc, 2005-2010
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