

# Caner Derici, PhD

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## Technical Skills

**Areas of Expertise:** Compilers & Programming Languages · Distributed Systems · Machine Learning  
**Languages:** Go · C/C++ · Python · Racket/Scheme · LLVM · Java · SQL · JavaScript  
**Cloud:** Kubernetes · AWS · GCE · Terraform · LXD · Docker  
**Productivity & Workflows:** Obsidian · Toggl · Todoist · Linux · Neovim · VSCode · Copilot · ChatGPT · Git · GH Actions  
**API, DB & Misc:** REST · gRPC · OpenAPI · FastAPI · DQLite · MongoDB · PostgreSQL · CI/CD · Jenkins

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## Education

Ph.D., [Indiana University, Bloomington](#), Computer Science, Compilers & Programming Languages 2015 – 2025  
Dissertation: [Self-Hosting Functional Programming Languages on Meta-Tracing JIT Compilers](#)  
M.Sc., [Boğaziçi University](#), Computer Science, Machine Learning & Natural Language Processing 2012 – 2014  
B.Sc., [Bilgi University](#), Computer Science 2005 – 2010

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## Experience

Canonical USA REMOTE, US  
**Software Engineer II (L4), distributed orchestration at scale, juju team** 2021 – 2024

- Developed and maintained Juju (see Projects below) as part of a 10-engineer team.
- 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 efforts; mentored junior engineers, and improved hiring by creating a structured Juju-Bootcamp process that cut ramp-up from 6 months to 1 month for new engineers.

Indiana University IN, US  
**Research Assistant, Course Instructor** 2015 – 2021

- Independently took an ambiguous, uncharted compiler problem from zero to 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 [Pycket](#) below).
- Taught data structures & algorithms, compilers, virtual machines, and domain specific languages.

Asseco SEE Group  
**Software Engineer** 2010-2012

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

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## Selected Projects

### [Juju: A large scale, eventually consistent distributed orchestration system](#)

Used by ~200 companies globally for managing cloud workloads on any infrastructure (Kubernetes or otherwise) across various cloud providers (e.g., AWS, GCE), capable of handling 1000+-node workloads with 99.9% availability. See Canonical above for my contributions. In Go, and Python.

### [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.

### [HazırCevap \(Witty\): 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.

Last compiled on October 21, 2025

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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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