

# 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  
**API, DB & Misc:** REST · gRPC · DQLite · MongoDB · PostgreSQL · Git · CI/CD · GH Actions · Jenkins

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## Experience

### Canonical USA

REMOTE, US

#### Software Engineer II (L4), Enterprise Cloud Engineering, Juju team.

2021 – 2024

Worked on distributed cloud orchestration system handling 1000+ node workloads across multiple regions with 99.9% availability. Primarily in Go, and Python.

- Architected full-stack distributed components, improved reliability, fault tolerance, back-pressure handling on an eventually consistent backend.
- Doubled the user base of client libraries [Python-libjuju](#), [Terraform Juju Provider](#)), owned all deliverables for 3 years, and maintained release cadence.
- Helped transition [Juju](#)'s data model from NoSQL MongoDB to relational DQLite (e.g., [sample PR](#)).
- Helped re-design the facade-based RPC API and developed a REST API alternative with OpenAPI.
- Took part in roadmap planning, cross-team coordination, mentoring junior engineers, and hiring.

### Indiana University

IN, US

#### Course Instructor, Teaching & Research Assistant

2015 – 2021

Work during PhD. I taught data structures & algorithms, compilers, virtual machines, and domain specific languages. Researched runtime performance of JIT compiled VMs for functional languages.

### Asseco SEE Group

#### Software Engineer

2012-2013

International software company developing virtual payment platforms for e-commerce platforms. I developed and delivered 3 virtual point-of-sale projects in 1 year. Used Java, Apache Tomcat, Spring, Mercurial, Jira.

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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 2011 – 2013

B.Sc., [Bilgi University](#), Computer Science 2005 – 2010

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## Selected Projects

### Juju

A large scale distributed orchestration engine for managing cloud workloads on any infrastructure (Kubernetes or otherwise) across various cloud providers (e.g., AWS, GCE). Juju is written in Go, and has over a million lines of code. I was a core maintainer in a team of 14 engineers. See Canonical above for details of my contribution.

### Terraform Juju Provider

A Terraform provider that enables integration with [Juju](#) while managing Terraform environments. I implemented new resources and features (e.g., [manual provisioning on AWS](#)), migrated the provider from the sdk2 to the provider framework (e.g., [sample PR](#)), and maintained release cadence of new versions. All in Go.

### Pycket: A meta-tracing JIT compiler as full-scale self-hosting Racket

PhD thesis project. Developed and maintained Pycket for over five years, designing the compiler to bootstrap the entire Racket language on a meta-tracing JIT backend. Contributed to a new IR (linklets, see publications) for a more portable Racket. Built [performance analysis tools](#) and [formalisms](#) to improve meta-tracing efficiency. Implemented run-time optimizations, preemption for threads, full FFI for data structures, and primitives.

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

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.

### 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). Full stack in Python and JS.

Last compiled on September 16, 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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