

# Oguz Ulgen

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## SUMMARY

Experienced software engineer with a strong background in compilers, language design and type theory.

## PROFESSIONAL EXPERIENCE

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### Facebook / Meta

2016 – Present

Staff Software Engineer

Worked as a primary engineer on HHVM (HipHop Virtual Machine) team building just-in-time (JIT) compiler that executes Hack Language code. The compiler is written in C++, OCaml and Rust.

- Optimized x86-64 assembly code generation
  - Profile guided optimizations such as load/store elimination, ref-counting elimination, stack frame elimination and inlining
  - Whole program analysis optimizations
  - Bytecode to bytecode optimizations
- Designed and implemented Hack Language features for type safety and privacy data flow analysis
  - Implicit Contexts and Co-effects: an async computation aware generalized system for the description and enforcement of permissions and restrictions of an implicitly declared contexts
  - Deep constant values (read-only): a feature to control mutability of reference types
  - Reified generics: runtime aware generic information for polymorphic programming
  - Type testing and type assertions
- Built CPU load driving based performance measurement framework that utilizes production traffic in a privacy-safe manner to
  - Automate performance regression detection
  - Enabled fast iterations by providing a toolkit for setting up, running and monitoring A/B tests
- Debugged and fixed Facebook-wide production critical events under heavy time pressure
- Facilitated core framework teams to perform massive scale migrations on a monolithic codebase to type safe and performant code

### Facebook / Meta

Summer 2015

Software Engineer Intern

- Built back-end infrastructure for finding visual regressions on mobile applications
- Designed and implemented an infrastructure for scheduling analysis jobs

### Microsoft

Summer 2014

Software Development Engineer Intern

- Developed back-end infrastructure for personalized machine learning models
- Improved user gender prediction models for personalized web search relevance

### Yahoo

Summer 2013

Mobile Engineering Intern

- Worked on Yahoo! Search native mobile application for iOS
- Co-authored an image decoding and processing library

### Biber

2011 – 2012

Junior Software Developer

- Developed a single-player iOS game

## PERSONAL PROJECTS

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### CudaPy Compiler

2015

- Designed and implemented a JIT compiler that translates CUDA kernels written in Python to C++
- Authored a Python runtime library that lets access to CUDA parallel computation API

### PCF (extended version of typed lambda calculus) Compiler

2014

- Investigated higher order typed program compilation
- Studied bytecode verification
- Authored a functional PCF compiler

## EDUCATION

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### Carnegie Mellon University, Pittsburgh, PA

2012 - 2016

- Bachelor of Science in Computer Science (GPA: 3.45/4.00)
- With a minor in Mathematics
- Dean's list for several semesters

## SKILLS

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C/C++, Python, OCaml, SML, Haskell, PHP, Hack, Rust, x86 assembly, Bash