

Oguz Ulgen

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SUMMARY

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

PROFESSIONAL EXPERIENCE

Facebook / Meta

2016 – Present

Staff Software Engineer

Worked as a primary engineer on HHVM (HipHop Virtual Machine) 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
- 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

Designed and coordinated compiler driven solutions to privacy, modularity and access control management across the company's web tier

- Pioneered scaling solutions to a monolithic codebase that allows
 - Modularized deployment with API level boundaries
 - Automated external privacy and legal compliance for data dependency and access control
- Created privacy data flow analysis via
 - 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
- Engineered type safety formalizations with
 - Reified generics: runtime aware generic information for polymorphic programming
 - Generalized native type testing and type assertions

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

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

Carnegie Mellon University, Pittsburgh, PA

2012 - 2016

- Bachelor of Science in Computer Science
- With a minor in Mathematics
- Dean's list for several semesters

SKILLS

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