

Saam Barati

Specialties

Virtual Machine architect specializing in compilers, JITs, speculative optimization, runtimes, performance analysis, and security

Experience

Software Engineer, Epic Games Sept. 2022 - Present

- Working on a VM for a new programming language

Software Engineer, JavaScriptCore @ Apple: 2015 - 2022

Software Engineering Manager of JavaScriptCore @ Apple: Feb. 2022 - Sept. 2022

- Created a low overhead and high fidelity sampling profiler and integrated it with WebKit's Web Inspector developer tools
- Wrote the try/catch implementation in the DFG and FTL optimizing compilers
- Extended JavaScriptCore's object model to support polymorphic prototypes in Structure
- Created JS Spectre Proof of Concepts as part of Spectre defense research
- Created the JetStream2 JavaScript benchmark used both by Apple and the wider industry
- Created a new version of the Safari Page Load Test benchmark used by Apple, notably creating a framework to make capturing and replaying modern web content
- Ported JavaScriptCore and parts of WebKit to Arm64 Macs
- Fixed over 100 security bugs in JavaScriptCore and did variant analysis to ensure the root causes were resolved
- Implemented efficient Map and Set JavaScript data structures, and integrated their operations into the DFG and FTL optimizing compilers
- Enhanced JavaScriptCore's inline caches to support polymorphic property name accesses
- Helped bring up the Web Assembly implementation in JavaScriptCore
- Wrote a Web Assembly baseline compiler in JavaScriptCore
- Enhanced the FTL's Loop Invariant Code Motion to speculatively hoist type checks
- Mentored 3 interns in JavaScriptCore and 2 interns from other teams in WebKit. Mentored 2 engineers on JavaScriptCore. (Prior to becoming manager.)
- Provided architectural guidance on many new JavaScriptCore features
- Over 1300 commits and 2200 patch reviews in JavaScriptCore/WebKit

Software Engineer Intern, JavaScriptCore @ Apple - 2014

- Created a value type profiler in JavaScriptCore and integrated it with WebKit's Web Inspector developer tools

Education

University of California Berkeley – BA in Computer Science, 2015

Blog Posts & Talks

- [Introducing the JetStream2 Benchmark Suite](#), Saam Barati and Michael Saboff, Mar 2019
- [Benchmarking WebKit](#), BenchWork 2018 at ECOOP, Jul 2018
- [JSC Loves ES6](#), Saam Barati, Yusuke Suzuki, and Filip Pizlo, Jun 2017
- [Introducing JSC's New Sampling Profiler](#), Jun 2016
- [JavaScript Type and Code Coverage Profiling](#), Aug 2015

Skills & Expertise

- C and C++
- x86 and Arm64 assembly
- Programming language implementation
- Interpreters
- Compilers
- JITs
- Efficient runtimes
- Concurrent programming
- Security analysis
- Performance analysis
- Benchmark development
- Mentorship and management

Oakland, CA, USA
+1 310-488-9241
saam@hey.com