Filip Jeremic

Contact Information

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https://jeremic.ca
https://github.com/fjeremic

Interests

Compiler development (static and dynamic), programming languages (design and implementation), machine learning, data science, parallelization, computer graphics, software protection, reverse engineering, and malware analysis.

Technical Skills

C, C++, Python, x86-64 Assembly, C#, Java
Expert, 10+ years

These technologies are the ones which I have used the most over the years. Because of my field of interest, low level programming languages such as various flavors of assembly, C, and C++ have been my primary languages of choice. Working on a just-in-time (JIT) compiler for Java has made me deeply familiar with these languages both from the angle of software engineering and performance optimization.

Linux, Unix tools, Windows, Docker, Jenkins, CMake, Bash, Qt
Advanced, 7+ years

My primary development platforms is Linux. I am very comfortable within a Unix environment carrying out tasks such as instruction level performance investigations (perf), assembly or source level debugging (gdb, IDA, Ollydgb, etc.), and remote SSH development using the technologies listed above.

NumPy, pandas, scikit-learn, TensorFlow, JavaScript, Perl, HTML, WPF
Experienced, 1+ years

Professional Experience

Qualcomm, Toronto, Canada

ML/Compiler development - Senior Staff Software Engineer **2021 - Present**

At Qualcomm I'm leading a small team focused on applying Machine Learning (ML) and data science to predict performance characteristics (ex. execution cycles) of ML operations (ex. convolution) on Qualcomm hardware. These ML models are used to improve optimizations within a production ML compiler so we can perform faster inference and to accurately predict KPIs on existing and future hardware.

IBM, Toronto, Canada

Compiler development - Advisory Software Engineer **2017 - 2021**

A natural progression of my previous position into a team leader role. During this exciting time we worked on open sourcing our compiler technology as part of the Eclipse OpenJ9 and Eclipse OMR projects on GitHub. As the open source communities grew, my role has been evolving into being one of the focal points for cross-platform JIT compiler development and community management.

- Elected as a committer/maintainer on both projects (200+ contributors each)
- Top code contributor across both projects
- Heavily involved in technical review of community pull requests, and driving backend compiler design and direction
- Continued leadership of the backed code generator team which successfully shipped the Java 11 and Java 17 long- term support (LTS) releases

Compiler development - Staff Software Engineer **2015 - 2017**

An extension of my previous role with a broader focus primarily on performance acceleration of Java workloads on Linux and z/OS. Part of my role involved sharing some of the team lead responsibilities in driving technical direction and management of backlog.

- Wrote intermediate language (IL) level optimizations benefiting all compiler backends (x86, ARM, AArch64, RISC-V, Power, z/Architecture)
- Delivered flagship features including String compression and Pause-less garbage collection in support of the Java 9 release

Compiler development - Associate Software Engineer **2013 - 2015**

Directly after graduation I took a position at IBM's compiler group where I worked on the backend of the just-in-time (JIT) compiler for the IBM J9 Java Virtual Machine (JVM).

- Developed and improved compiler features including intrinsics, register allocation, instruction scheduling, and optimal instruction selection for various processors
- Performed instruction level performance investigations and realized 10% improvement targets on key benchmarks prior to new generation processor release dates
- Postmortem core dump analysis of non-deterministic code generator bugs
- Developed a firm understanding the interaction between the various components of a dynamic runtime environment (VM, GC, JIT), particularly in the context of a JVM

Patents

- **Object load introspection using guarded storage**
  Patent No. US11080182B2 **Issued 2021-08-03**
- **Software-directed value profiling with hardware-based guarded storage facility**
  Patent No. US20210208927A1 **Issued 2021-07-08**
- **Copying and forwarding for concurrent copying garbage collection**
  Patent No. US10877884B2 **Issued 2020-12-29**
- **Multi-byte compressed string representation**
  Patent No. US10002010B2 **Issued 2018-06-19**

Education

McMaster University, Hamilton, Ontario, Canada

Master's Student **2012 - 2013**

M.Eng., Computer Science

McMaster University, Hamilton, Ontario, Canada

Undergraduate Student **2008 - 2012**

B.Sc., Honours Mathematics and Computer Science

References available upon request.