Albert Gafiyatullin

Compiler Engineer
Open for relocation (visa sponsorship)

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Summary

Software Engineer with 2 years of experience specializing in the development of JVM JIT compiler and runtime for VLIW CPU. Looking for Compiler Engineer positions, passionate about programming language runtimes and compiler technologies.

Experience

UNIPRO — Novosibirsk, Russia

- *Compiler Engineer, Java Virtual Machine team* — *Mar. 2021 - Present*

  C++ | JVM | Assembly Language | JIT Compilers Design | Garbage Collection | GNU Debugger | Perf

  JVM Runtime and JIT Compiler development for Elbrus VLIW processor by MCST:

  - Adapted the C2 compiler for tiered compilation, which improved average startup performance by 50% compared to non-tiered compilation;
  - Designed and implemented a fast compiler named 'C0' for warmup compilation levels (instead of C1), taking into account the features of Elbrus VLIW CPU architecture. This resulted in a 25% improvement in average startup performance for machines with a small number of cores, compared to tiered compilation based on the adapted C2 compiler;
  - Improved performance for certain string and XML tasks by up to 8% using intrinsics;
  - Reduced runtime overhead by implementing platform-dependent improvements for implicit null checks.

Projects & Courses

- **COOL Compiler** — *Sep. 2021 - Present*

  C++ | LLVM | Garbage Collection | Compilers Design | GNU Debugger

  Implementation of COOL compiler and runtime with LLVM:

  - AArch64 and x86-64 as target architectures;
  - Shadow Stack and Stack Maps for call-stack traversal;
  - Stop-The-World Garbage Collectors:
    - Mark-and-Sweep GC;
    - Jonkers's threaded compaction (Mark-and-Compact) GC.
    - Kermany and Petrank's compressor (Mark-and-Compact) GC.
    - Semispace Copying GC.

- **SOE.YCSCS1: Compilers** — *Oct. 2021*

  C++ | MIPS | Compilers Design | Assembly Language

  Implementation of COOL compiler for SPIM emulator.

Education

- **Novosibirsk State University** — Novosibirsk, Russia
  Master's degree in Computer Science — *Sep. 2021 - Aug. 2023 (Present)*
  - **Thesis**: The tiered compilation in Java Virtual Machine for Elbrus platform.
- **Novosibirsk State University** — Novosibirsk, Russia
  Bachelor's degree in Computer Science — *Sep. 2017 - Aug. 2021*
  - **Thesis**: Development of a computational module for the simulation of fast-neutron reactor core destruction.
    - Developed an eutectic interaction model;
    - Optimized a calculation time to 2.5 times for IO-intensive tasks.
  - **GPA**: 4.8/5.0, graduated with honors

Achievements

- **Huawei Scholarship Winner** — Novosibirsk, Russia — *2020 - 2021*

  C | C++ | OpenMP

  Awarded by Huawei for academic achievements.

Programming Skills

- **Languages**: C++, C, Assembly Languages, Java, Python.
- **Technologies**: JVM internals, Compilers Design, CPU Architecture.
- **Tools**: GNU Debugger, Bash, Perf, Intel VTune Profiler.