

# Albert Gafiyatullin

Compiler Engineer

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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  
Mar. 2021 - Present

- Compiler Engineer, Java Virtual Machine team

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

- C++ LLVM Garbage Collection Compilers Design GNU Debugger

Sep. 2021 - Feb. 2023

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;
  - Kernigh and Petrank's compressor (Mark-and-Compact) GC;
  - Semispace Copying GC.

### SOE.YCSCS1: Compilers

- C++ MIPS Compilers Design Assembly Language

Oct. 2021

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  
C C++ OpenMP 2020 - 2021  
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.