Aleksei Alekseev, Alekseevich

Graduate MIPT student

CONTACTS

Phone:
+7 (913) 922 87 88

Telegram:
https://t.me/aleksey_triple_a

GitHub:
https://github.com/alexxRT

Mail:
alekseev.aa@phystech.edu

COURSES

C/C++ PROGRAMMING

LINUX KERNEL, OPERATING SYSTEMS

LLVM/MLIR

COMPUTER MICROARCHITECTURE

DATA ANALYSIS/BASICS of AI

DISCRETE ANALYSIS, GRAPH THEORY

ACADEMIC ENGLISH C1

HARD SKILLS

- Strong Analytical Skills
- C/C++/Python
- MLIR, tf dialect
- Git
- CMake, Make
- Linux shell
- Algorithms on graphs
- Concurrency, asynchronous programming

ABOUT ME:

- **Initiative and hard working student.**
- **Keen on solving challenging problems.**
- **Responsible and result focused.**
- **Comunicative and stress tolerant.**
- **Curious about AI and Compilers.**

EMPLOYMENT HISTORY:

Huawei Russian Research Institute (01.07.23 - Current Time)

Our team is working on investigation and implementation of new approaches in dynamic workloads scheduling on heterogenous LITTLE, MIDDLE, BIG microarchitectures to plummet power consumption and increase devices' performance.

PROJECTS:

TensorFlow dialect annotation MIPT thesis work

Link: https://github.com/alexxRT/mipt-thesis

The work was dedicated to laying the foundation for future end-to-end profile-guided optimization (**PGO**) within the context of **MLIR**. By annotating execution times of **TensorFlow IR** operations, the approach enables potential graph transformations aimed at resolving performance bottlenecks and optimizing for specific hardware targets.

LLVM based compiler

Link: https://github.com/alexxRT/LLVM-course

A custom compiler for a proprietary programming language was developed using the complete LLVM infrastructure. This work provided a solid foundation in compiler construction and deepened the understanding of compiler internals. Key components included **recursive descent** parsing, abstract syntax tree (**AST**) generation, intermediate representation (**IR**), **custom passes**, **target registration**, and **code generation**.

RISC-V simulator

Link: https://github.com/alexxRT/riscv64-simulator

With cooperation of other students was developed industry level RISC-V functional simulator and measured performance on eight queens problem. During the project I delved into **elf** files layout, **dynamic libraries** loading, **LLVM** based JIT**, Basic Blocks** and **Tail Call** optimization. Managed peculiarities in bits alignment in RISC-V ISA.

LAB RESEARCH

Link: https://github.com/alexxRT/PhysicsProjects

I investigated dependency between droplet's temperature and its falling height. As a result, I delivered my presentation to a group of physicits in scientific English language.