

## CONTACT

- ✉ subkhankulov.rr@phystech.edu
- ✉ subkhankulov@ispras.ru
- 🌐 RustamSubkhankulov
- ☎ +7 (917) 346-91-17
- 📍 Dolgoprudny, Russia
- 🏠 Neftekamsk, Republic of Bashkortostan

## SKILLS

### Speciaization:

Software Development, System Programming, Operating System Development, Object-oriented Programming

### Languages:

C, C++, Assembly, Python, Verilog

### Tools:

Make, Cmake, git, gdb, KCachegrind, Valgrind, qemu

### Other:

Dot, SFML, MPI

### Foreign languages:

English (Upper Intermediate)

## ACHIEVEMENTS

### All-Russian Olympiad for schoolchildren in geography

Prize-winner (2021)

### MIPT 'Phystech' physics olimpiad

2<sup>st</sup> degree diploma (2021)

### "Rosatom" physics olimpiad

1<sup>st</sup> degree diploma (2021)

# SUBKHANKULOV RUSTAM

MIPT - Applied Mathematics & Physics

## EDUCATION

### Bachelor of Applied Mathematics & Physics - 4th year

2021 - 2025

MIPT, DREC - Moscow, Russia

GPA: **9.12/10.00**

GPA in programming: **9.75/10.00**

## WORK EXPERIENCE

### Middle laboratory assistant

2023 - 2024

ISP RAS - Moscow, Russia

Laboratory assistant at ISP RAS, Software Engineering Department. Real-Time Operating System development.

### Internship at ISP RAS

2022

Tools: C, Make, syzkaller, svace

Supervisor: Alexey Khoroshilov(khoroshilov@ispras.ru)

The internship allowed to get an idea about the structure of the Linux kernel, to master principles of interaction with the international community of kernel developers, prepare and send patches that were included in one of the largest free software development projects security.

## COURSES

### Course "Designing the operating system kernel"

2022 - 2023

GitHub

Tools: C, Make,

Supervisors: Alexey Khoroshilov(khoroshilov@ispras.ru)

Vitaly Cheptsov(cheptsov@ispras.ru)

Development of the core of the educational operating system called JOS. The basis of this course is MIT's operating system graduate class

### STM32F051 microcontroller programming course

2023

GitHub

Tools: C, Make, ARMv6 Assembly

Supervisors: Vladislav Aleinik(valeinik@ispras.ru)

The purpose of this course is to give students a basic understanding of the design and principles of working with the STM32F051 microcontroller.

"Introduction to FPGA and Verilog" course at MIPT DREC.

## ASSIGNMENTS & PROJECTS

### JIT-compiler

2022

GitHub

Tools: C, Make

Supervisor: Ilya Dedinskiy (ded@ded32.ru)

JIT compiler that translates binary code intended for execution by a virtual processor into x86 architecture instructions.

### Shift-reduce parser

2024

GitHub

Tools: C++, Cmake

Shift-reduce parser for simple 'arithmetical' grammar. Educational project at compilers course at MIPT DREC.

### Lexer

2024

GitHub

Tools: C++, Cmake

Lexer for non-existent programming language, implemented with flex. Educational project at compilers course at MIPT DREC.

### Red-Black Tree

2023

GitHub

Tools: C++, Cmake

Red-black tree implementation with graphical dump feature and optimized methods for range queries.

### LFU caching algorithm implementation

2023

GitHub

Tools: C++, Cmake

LFU cache implementation with its comparison to 'perfect caching algorithm'.

### Hash table

2022

GitHub

Tools: C, Make, KCachegrind, Python

Supervisor: Ilya Dedinskiy (ded@ded32.ru)

Hash table implementation with Assembly optimizations. Comparing of different hash functions using hash table.

### Mandelbrot set visualization optimizations

2022

GitHub

Tools: C, Make, SIMD

Supervisor: Ilya Dedinskiy (ded@ded32.ru)

Mandelbrot set visualization implementation with AVX optimizations.

### Alpha-blending

2022

GitHub

Tools: C, Make, SIMD

Supervisor: Ilya Dedinskiy (ded@ded32.ru)

Alpha-blending implementation with AVX optimizations.

### Ray-tracing

[GitHub](#)

Tools: C++, Make

Supervisor: Ilya Dedinskiy (ded@ded32.ru)

2022

C++ implementation of raytracing.

### Computation mathematics methods

[GitHub](#)

Tools: Jupyter Notebook

2023-2024

MIPT DREC Computational Mathematics course labs

### Assembly printf implementation

[GitHub](#)

Tools: C, X86-64 Assembly

Supervisor: Ilya Dedinskiy (ded@ded32.ru)

2022

Assembly-language implementation of the printf function, calling according to the System V AMD64 ABI convention. Also some string functions implemented in X86-64 assembly.

### "Harry Potter" language compiler

[GitHub](#)

Tools: C, Make

Supervisor: Ilya Dedinskiy (ded@ded32.ru)

2021

Compiler for my own programming language. Translating into my own assembly and generating byte-code for virtual CPU. Syntactic and lexical analysis, AST intermediate representation

### List data structure

[GitHub](#)

Tools: C, Make

Supervisor: Ilya Dedinskiy (ded@ded32.ru)

2021

Cache-friendly doubly-linked list structure.

### The "Akinator" game

[GitHub](#)

Tools: C, Make

Supervisor: Ilya Dedinskiy (ded@ded32.ru)

2021

Parsing data base saved in text format and creating binary tree structure for the game.'Dot' graphic dump of tree.

### Differentiator

[GitHub](#)

Tools: C, Make

Supervisor: Ilya Dedinskiy (ded@ded32.ru)

2021

Parsing expressions and symbolic differentiation using binary tree. Simplification of arithmetic expressions (constant convolution).

## INTERESTS

Operating systems, processor architecture, computer architecture, low-level optimizations, compilers

## PERSONAL QUALITIES & SOFT SKILLS

Learning ability, communication skills, desire to learn new things, teamwork