# MAKLAKOV ARTEM


+7 915 433 96 29

art.maklakov28@gmail.com

maklakov.am@phystech.edu

@artyo_Om

worthlane

Moscow, Russian Federation


## Education

### Moscow State School 57

High school, specialized physics class

2019-2023 **GRADUATED WITH A GOLD MEDAL**

### Moscow Institute of Physics and Technology

Phystech School of Applied Mathematics and Informatics

2023-PRESENT **SECOND YEAR STUDENT**

## Grades

**Programming disciplines**

GPA: **9.00 / 10**

**Overall**

GPA: **8.45 / 10**

**The course of system programming and compiler technologies (MIPT)**

Grade as listener: **10 / 10**

Current status: **Mentor**

## Experience

Aug 2024 **HUAWEI Open Days**

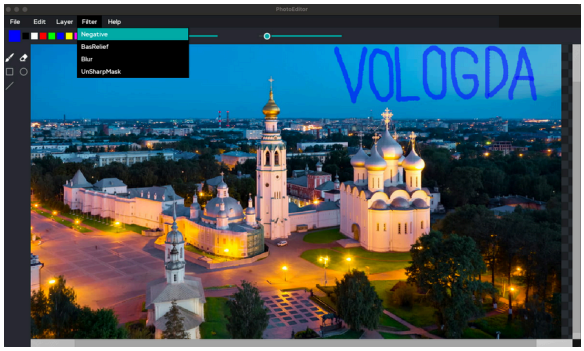
Studying the principles of Retrieval Augmented Generation (RAG) for AI-code generation.

## Projects

Dec 2024 Tools: C/C++, SFML

### Photo editor

A photo editor with support for third-party plugins (made in accordance with the standard). Plugins are connected using dynamic linking.

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April 2025 Tools: C/C++, Graphviz, LLVM

### LLVM Pass

Generates a DOT graph of the instruction flow during compilation. Instruments the code with logging functions to collect dynamic runtime data, such as: execution results, instruction execution counts.

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Dec 2023 - May 2024 Tools: C/C++, ASM, Graphviz

### "57Lang" programming language with x86 compiler

Esoteric programming language with three stages of code processing:
Frontend generates AST-tree from code;
Middle-end optimizes AST-tree;
Backend translates AST-tree to intermediate representation, which is used by compiler for ELF-file generation.

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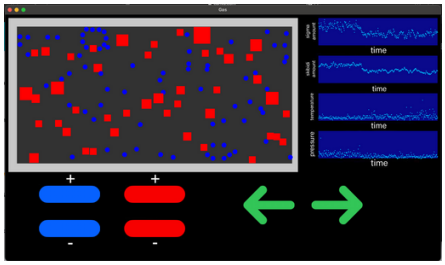
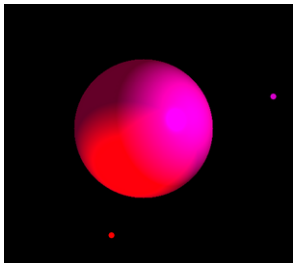
Oct 2024 Tools: C/C++, SFML

### Gas simulator



### Rendering



## Skills

- C/C++
- Algorithms and data structures
- Concurrency
- Assembly x86 & ARM
- Python
- Git
- Make
- GDB
- LLVM
- LATEX
- SFML

## Achievements

### International Experimental Physics Olympiad (IEPHO)

Two times bronze medal

2019, 2020

### Russian National Olympiad in Physics

The final stage prize-winner

2022

### First-Leveled Russian Olympiads

Multiple winner in physics and mathematics

2020-2023

### Maxwell Physics Olympiad

The final stage winner;
The regional stage winner
(the final stage was cancelled)

2019, 2020

Dec 2024 - Dec 2025 — Tools: C/C++, Python

### Algorithms and Data Structures

Repository contains laboratory works and tasks on the following themes:

- Search data structures
- Range minimum query (RMQ), range sum query (RSQ)
- Dynamic programming
- Graphs: spanning trees, lowest common ancestor (LCA), paths
- Hashing algorithms
- Matchings, flows

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April 2024 — Tools: C/C++, ASM, Kcachegrind, Python

### Assembly hashtable optimizations

Analysis of the hashtable requests speed. Optimizations with SIMD operations and assembler insertion blocks.

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March 2024 — Tools: C/C++, ASM, SFML

### Mandelbrot set generation

Studying the speed impact of replacing usual instructions with SIMD.

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November 2023 — Tools: C/C++, Graphviz, LATEX

### Differentiator

Program generates scientific work, that contains equations derivatives, simplifications, Taylor series and graphics. Result is a LATEX document, that contains funny phrases and pseudoscientific nonsense.

## Languages

- Russian (Native)
- English (Upper Intermediate)

## Soft Skills

- Sociable
- Hard-working
- Responsible
- Organized

## Interests

- System programming
- Compiler technologies
- Machine learning
- Operating systems

## Others

I am a very active and organized person. I have helped my institute organize events on many occasions. One of the most recent events was the "Phystech" olympiad in Yekaterinburg and the MIPT Summer Programming School.
My favorite sport is hockey. I play for a team in the Night Hockey League. I also enjoy traveling with friends.