

# Mariia Zhytnikova (Software Development)

Helsinki, Uusimaa, Finland

Phone: (+358) 46 57 60 200

Email: [allusio@gmail.com](mailto:allusio@gmail.com)

LinkedIn: [linkedin.com/in/mariia-zhytnikova](https://www.linkedin.com/in/mariia-zhytnikova)

GitHub: <https://github.com/MariiaZhytnikova/>

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Software Developer transitioning from a scientific background, combining strong analytical thinking with hands-on experience in C/C++, Linux, and project-based learning at Hive Helsinki. I have a solid foundation in systems programming and experience working with multiple programming languages.

I enjoy breaking down complex problems and troubleshooting challenging technical issues in both individual and team-based projects. My research background strengthened my communication skills, ability to work under pressure, and to meet tight deadlines.

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**Languages:** English – Fluent | Ukrainian – Native | Russian – Fluent | Finnish – B1

## TECHNICAL SKILLS:

### Programming Languages:

C, C++, Python, JavaScript, TypeScript, Shell Script

### Databases:

PostgreSQL, MariaDB, SQL basics

### Tools & DevOps:

Git, GitHub, Docker, Docker Compose, Nginx, Vite, CI/CD (GitHub Actions)

## PROJECTS

### Minishell – C, POSIX (Group)

[GitHub](#)

Implemented a POSIX-compliant shell supporting pipes, redirections, built-ins, and signal handling using low-level UNIX system calls and explicit memory management.

### Webserver – C++ (Group)

[GitHub](#)

Built an HTTP/1.1 C++ server with socket networking, cookie-based sessions, and production-style request parsing with error handling inspired by Nginx.

### Inception – Docker, Nginx, MariaDB (Individual)

[GitHub](#)

Deployed a containerized multi-service architecture using Docker Compose, including SSL termination, persistent storage, and service isolation on a virtual machine.

### 2D Game – C, MLX42 (Individual)

[GitHub](#)

Implemented a real-time 2D game engine with event-driven rendering, input handling, and collision detection using a low-level graphics API.

### 3D Game – C, MLX42 (Group)

[GitHub](#)

Implemented a raycasting-based 3D engine with texture mapping and real-time rendering, focusing on performance, mathematical correctness, and low-level graphics optimization.

**Hive — TypeScript, Canvas (Group)**[Lifelink](#) [GitHub](#)

Implemented and deployed a turn-based strategy game featuring interactive canvas rendering and a rule-based AI opponent. Designed a modular TypeScript architecture and implemented a minimax algorithm with alpha-beta pruning, heuristic evaluation, and move pruning to enable efficient decision-making under real-time constraints.

**AirGuardian — Python, JavaScript (Group)**[GitHub](#)

Implemented a telemetry processing and visualization pipeline for drone data, fetching and parsing telemetry from a JSON API and detecting airspace violations using geospatial logic with real-time canvas rendering.

**EXPERIENCE***Research officer***IRE NASU** - Kharkiv, Ukraine*Dec 2017 - June 2024*

Performed molecular dynamics simulations and structural analysis of protein-DNA interactions, including molecular dynamics simulations, structural calculations, and data interpretation, working with complex data and computational workflows.

*Senior Scientific Consultant***NIBR (external collaboration via IFNUL)** - Lviv (remote), Ukraine*March 2018 - Apr 2024*

Conducted in-depth literature and clinical database reviews on target-disease associations and related therapeutics. Analyzed and systematized findings, delivering clear analytical reports to support research and decision-making.

**EDUCATION****Helsinki Hive**, Helsinki — Software Development*Nov 2024 - current***Karazin University**, Kharkiv — *Ph.D. in Biophysics, Mathematical & Physical Sciences**June 2017***Karazin University**, Kharkiv — *M.Sc. in Biophysics, with honors**Completed***COURSES****Supervised Machine Learning: Regression and Classification (Stanford University / Coursera)**

Learned to build and train supervised ML models for prediction and binary classification using Python, NumPy, and scikit-learn, including linear and logistic regression.

**OpenCV (IT Jim)**: Image processing, feature detection, object tracking, real-time video analysis.**Kaggle**: Data preprocessing, model selection, performance evaluation through competitions.**Data Scientist (Data Quest)**: Python, pandas, data cleaning, visualization, statistical modeling.

**Full Stack (Helsinki University) *ongoing***: JavaScript, TypeScript, Node.js, React, PostgreSQL, REST APIs.