UROŠ **FILIPOVIĆ**

Software Engineer

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I am a software engineer combining low-level programming and embedded systems knowledge with practical machine learning expertise. My work ranges from transformer-based NLP systems and thermal image processing to evolutionary algorithms for engineering optimization. I have hands-on experience implementing AI solutions across platforms. I believe in bridging theoretical ML concepts with practical engineering constraints, drawing on my background in both hardware and algorithms to create efficient, innovative solutions.

Education

October 2022 - Present	**School of Electrical Engineering** Software Engineering, Masters degree Belgrade, Serbia
July 2018 - October 2022	**School of Electrical Engineering** Computer Technology and Informatics, Undergraduate degree Belgrade, Serbia
June 2014 - July 2018	**6th Belgrade Grammar School** Natural Sciences and Mathematics Belgrade, Serbia

Skills

Programming Languages	**C**, **C++**, **Rust**, **Python**, C#, Java, Javascript , HTML5, CSS.
Embedded Platforms	**ARM-CM3**, Atmel, NXP, Arduino, Rapberry Pi.
Frameworks	Loco.rs, Angular, Vue, **.Net**.
Game Development	**Bevy**, **Unity 3D**, OpenGL.
Database Technologies	MySQL, MongoDB.
Operating Systems	**Windows**, **Linux**, macOS, Android.
Other Tools	VIM, Git, Bash, Visual Studio Code, LaTeX, Microsoft Office, Blender, CorelDRAW.

Languages

Serbian	●●●●●
English	●●●●●
French	●○○○○

Strengths

- Creative
- Inspired
- Problem solver

Projects

Real-Time Volumetric Cloud Rendering in Unity — 2025

github.com/uros117/cloud-rendering

Master thesis project implementing physically-based volumetric cloud rendering with advanced light scattering models. Features GPU-accelerated 3D noise generation, energy-conservative two-lobe Henyey-Greenstein phase function, adaptive ray marching with lookup tables, and real-time performance optimization achieving 70+ FPS at 1080p.

Unity 3D | C# | HLSL | Compute Shaders | Ray Marching | GPU | Volumetric Rendering | PBR

Movie rating based on the contents of subtitles and transformer neural networks 2024

github.com/AboveAverageUsername/opj_project

A project for Natural Language Processing course. It uses Berts CLS output tokens do clasify the entire contents of the subtitles of a movie into classes that represent grades from the IMDB database.

NLP | Python | Pytorch | Transformer | Neural networks | AI

Dream Odyssey 2024

github.com/uros117/dream-world

Dream World is a side scrolling action roll playing game that was made as a submission for the Engage Game Jam 2024 theme "Dream world". It was made in Unity 3D with an ability tree and a mechanic that allows switching between good and bad dream which allows dynamic gameplay and engaging puzzles.

Unity 3D | Game Design

Comparison of 3D Game Development Tools : JavaFX, Bevy, and Unity 3D 2022

github.com/uros117/3d-game-development-comparison

Undergraduate thesis comparing three game development technologies through implementation of identical 3D labyrinth games. Conducted comprehensive analysis using objective metrics (code size, performance, platform support) and subjective evaluations from 21 users. Unity emerged as the best overall choice, while Bevy showed excellent potential despite being newer. Research provides practical guidance for technology selection in game development.

JavaFX | Bevy | Rust | Unity 3D | C# | Java | Game Development | Performance Analysis | UX Research

STM32F103 STEAM Time-based One-Time Password generator 2021

github.com/uros117/stm32f103-steam-totp-generator

A steam Time-based One-Time Password generator for stm32f103. The MCU is normally in SLEEP mode, unless you wake it up using a button or connect it to a PC via USB. Time can be changed through a UART connection.

Embedded | TOTP | ARM | CM3

System Software project 2021

github.com/uros117/system_software_project

Assembler, linker and emulator for a small theoretical platform.

C++ | C | Emulation | Assembly

Operating Systems 1 project 2020

github.com/uros117/os1proj

Small OS kernel written in C++ and compiled using the BCC compiler.

C++ | OS kernel

FPGA pong game 2020

github.com/uros117/pong_fpga_ort2

A pong implementation for a Altara Cyclon III FPGA board. Player number one plays the game using a keyboard and player number two using a PS2 mouse. Everything is displayed using a VGA display connected to the board.

FPGA | VGA | Game

Evolutionary optimization of wind turbines through CFD simulations and genetic algorithms 2017 - 2018

Video presentation

I used Computational Fluid Dynamics simulations to optimize the shape of vertical axis wind turbines and make them more efficient.

Machine learning | CFD | Java | Comsol Multiphysics | Genetic algorithms

Back massaging robot arm with thermal vision 2016 - 2017

Video presentation

Robot arm that uses thermal vision to detect spasms and after that treats them.

Embedded | Computer Vision | Arduino | Raspberry Pi

Interactive promotional display

2015 - 2016

Video presentation

Role of interactive promotional display is the realization of interactive communication with the target group (the youngest population), a survey of the target group at them funny way, collection and storage statistics survey. I used Arduino to control the display and C# and Bluetooth to design an application for data collection.

Embedded | Arduino | UX design

Bonbon Console

2014 - 2015

Video presentation

Robot arm that uses thermal vision to detect spasms and after that treats them.

Embedded | Arduino

Experience and Volunteering

November 2022 - Present — Software Engineer, VLATACOM INSTITUTE, Belgrade, Serbia
- Working on various Research and Development projects.
- Commercial audio and data encryption devices.

C++ | Rust | CUDA | Cryptography | Qt | Embedded | Linux | PinePhone | Audio DSP | STM MP1 | NXP | Yocto | Java Card

March 2021 - May 2021 — Internship, VLATACOM INSTITUTE, Belgrade, Serbia
- Develpment of an algorithm for merging images from thermal and visible spectrum.
- Image overlapping using CNN feature detection and description based on D2-Net implementation.
- https://doi.org/10.1038/s41598-020-80189-1

Computer Vision | Python | Image fusion | CNN

August 2018 - August 2018 — Volunteer, US-Serbia and West Balkan Data Science Workshop , Belgrade, Serbia
- International Data science conference.
- Organisers : Intersection, Temple University, USA, and Mathematical and Archeological Institutes of the Serbian Academy of Sciences and Arts.

Data Science

August 2020 - September 2020 — Participant, Qiskit Global Summer School, Online
- Quantum computing conference with emphasis on Computer science and quantum algorithms.
- Implementation of quantum algorithms in python.
- Hardware basis for superconducting qubits.
- Quantum error correction.

Quantum computing | Computer Science | Physics | Python

October 2013 - June 2018 — Student, Regional Centre for Talented Youth Belgrade II, Belgrade, Serbia
- Department for Computer science.
- Weekly lectures about various currently important themes in the field.
- Yearly research projects and competitions.

Competitions | Research projects

April 2018 - April 2018 — Participant and Volunteer, International Conference of Young Scientist 2018, Belgrade, Serbia
- With project "Evolutionary optimization of wind turbines through CFD simulations and genetic algorithms".
- Bronze medal in Computer Science.

Machine Learning | Java | CFD

August 2017 - August 2017 — Volunteer, International Geography Olympiad (iGeo) 2017, Belgrade, Serbia
- Technical support, interactive ranking software for cultural evening designer and organization volunteer.

Computer Vision | Embedded | Raspberry PI

April 2017 - April 2017 — Participant, International Conference of Young Scientist 2017, Stuttgart, Germany
- With project "Back massaging robot arm with thermal vision".
- Silver medal in Engineering.

Computer Vision | Embedded | Raspberry PI

April 2016 - April 2016 — Participant, International Conference of Young Scientist 2016, Cluj-Napoca, Romania
- With project "Game Suit".
- Silver medal in Computer Science.

Virtual Reality | Embedded | Unity 3D

Honors and awards

2024 **ENGAGE Game Jam** first place in Galactic Pioneers category.
2020 **Certificate of Quantum Excellence** from Qiskit Global Summer School.
2018 **World Intellectual Property Organization Schoolchildren's trophy** for project "Back massaging robot arm with thermal vision".
2018 **Bronze medal ICYS 2018** - "Evolutionary optimization of wind turbines through CFD simulations and genetic algorithms".
2017 **Silver medal ICYS 2017** - "Back massaging robot arm with thermal vision".
2016 **Bronze medal ICYS 2016** - "Game Suit".
2016 - 2018 **Various other national level honors.**