Ivaylo Danailov Kozhuharov

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Professional Summary:

Computer Engineering graduate with experience in COMSOL-based nano-device modeling, machine learning systems, and simulation tool development. Proficient in Java, Python, and low-level programming, with full-stack and front-end experience (HTML, CSS, JavaScript). Strong technical communicator with the ability to quickly learn and apply new technologies.

Technical Skills:

Languages: English, Bulgarian
Programming Languages: Java, C, C++, JavaScript, Python, SQL, Verilog
Web & Tools: HTML, CSS, Git, Spring Framework
Engineering & Modeling: COMSOL 6.4, nano-scale device modeling
Concepts: Data Structures, Machine Learning, Computer Architecture, Graph Algorithms

Education:

University of Washington Tacoma
Bachelor of Science in Computer Engineering and Systems
Graduated: June 2023
Major GPA: 3.48

Professional Experience:

Star Hop Nano Labs — Engineering Researcher (COMSOL Modeling)
April 2025 – Present

- Modeled nano-coil geometries in COMSOL to improve magnetic induction sensitivity for nanoscale detection systems. Improving the change in inductance based on size of particle by two orders of magnitude.

- Managing and optimizing very large and computationally expensive models. Including building and parametrizing the geometry and creating custom meshes to optimize for accuracy and runtime. Improving on the default mesh's average element quality of ~0.58 to ~0.70, reducing runtimes by hours or sometimes a full day.

- Researching alternative detection methods such as SQUID and Vibrating sample magnetometry.

- Star Hop is a 3-person startup company

C2 Education — Tutor (Math, Physics, Computer Science/Engineering)
March 2023 – Present

- Communicating complex concepts from math, physics, and computer science to children from 5th grade up to freshmen in college, improving their grades by a letter on average.

- Managing tens of students' records including presence, difficulties and strengths, homeworks, and projects.

- C2 Education is a chain of tutoring centers all over the US.

Projects:

Maze Generator (2022) — GitHub Repository, Secondary Repository

- Implemented graph traversal algorithms

- Creating a tomcat server running on Amazon Web Services to host a web version of this project. (not currently active)

- Built a full stack application using the Spring MVC framework.

- Set up a CI/CD pipeline through GitLab in order to do live updates to the web application.

GravitySim2 (2025) — GitLab Repository

- Designed a scalable object-oriented 2D physics engine

- Implemented kinematics simulation techniques using the Varlet integration method to achieve realistic orbital mechanics and planetary system formation.

- Developed an asynchronous tick system to reduce time variability due to differing calculation times. Additionally used multi-threading physics calculations to improve physics calculation times.

- Wrote extensive documentation in order to keep the code base readable and easily understandable by humans.

Senior Project – UEFI System Analysis Tools

- Managed a multi-person, year-long project

- Worked with UEFI and low-level Intel chip programming

- Navigated team and personnel challenges

Additional Training:

Revature Pre-Training Course

- March 2024 – June 2024

- Portfolio