

# Mariia Eremina

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## PROFESSIONAL EXPERIENCE

### Software Engineer

Sep 2024 – Present


MIT — Massachusetts Institute of Technology

Remote

- Developing a clinician-focused full-stack web application to combine Harvard Medical School's state-of-the-art AI projects, optimized for deployment in hospital settings, using Python, Flask, JavaScript, and React
- Onboarding new team members, enhancing team dynamics and ensuring a smooth transition into their roles

### Co-Founder & Lead Software and Computer Vision Engineer

May 2024 – Dec 2024


CarGo Relay  — Sustainable AI-based Last-Mile Delivery EPFL-based Startup

Lausanne, Switzerland

- Organized cross-functional team work with Jira as the management tool and developed a cross-platform mobile application for iOS and Android using React Native, MongoDB, and Firebase

### Computer Vision Research Engineer — Deep Learning

Mar 2024 – Sep 2024

MIT & Harvard  — #1 and #4 ranked universities (globally)

Boston, USA

- Increased the co-registration speed of video frames by 40x through the development of a new spline-based algorithm and utilizing flow matching for high-precision cardiovascular surgery hardware, using Python, Tkinter, PyTorch and OpenCV
- Engineered a robust cross-platform application for precise video co-registration, efficiently managing diverse displacements in medical imaging and reducing manual work per patient from 3 hours to just 5 seconds
- Optimized video quality using models such as Stable Diffusion Inpainting, Segment Anything Model (SAM), and CLIPSeg
- Adapted applications for a cross-platform compatibility (macOS, Windows, Linux) to integrate with any medical hardware

### Software & Machine Learning Engineer

Jun 2023 – Mar 2024

Maxon Group — Swiss manufacturer and supplier of high-precision motor systems

Lucerne, Switzerland

- Implemented custom anomaly detection algorithms, combining different machine learning techniques like Autoencoder and Siamese network for motor quality detection, using Python, OpenCV, and PyTorch
- Led a cross-functional team of 2 software engineers, 1 machine learning engineer, and 2 external AI experts from CSEM to design, develop, and deploy a motor quality detection system, fostering a well-organized and positive team environment
- Created a customer-focused website for motor quality detection using FastAPI, JavaScript, PostgreSQL and Docker
- Wrote pytest unit tests to achieve over 90% code coverage, ensuring the reliability and robustness of the system

### Machine Learning Engineer

Dec 2022 – May 2023

AGORA Cancer Research Center 

Lausanne, Switzerland

- Developed a deep learning framework with YOLOv5 and DeepSORT to detect and track cancer organoid stages, reducing manual work time by 50%, and supporting research at CHUV (Lausanne's research hospital)
- Collaborated closely with interdisciplinary teams to gather and process large-scale imaging data (~150 TB), leveraging this information to enhance the accuracy and precision of the cancer detection

## EDUCATION

### Master Thesis in Computer Science

2024

MIT — Massachusetts Institute of Technology

Boston, USA


- Master Thesis Title : *"Landmark-Based Co-Registration of Coronary Computed Tomography and Intravascular Images"*

### Master of Computer Science & Life Science

2021 – 2024

EPFL — Swiss Federal Institute of Technology

Lausanne, Switzerland

- Relevant coursework: AI Product Management, Machine Learning, Applied Data Analysis, Computer Vision, Computational Photography, Mathematics of Data, Deep Learning for Autonomous Vehicles, Image Processing for Earth Observation
- Organized annual hackathons  sponsored by AWS, UBS, Logitech, SBB, Swisscom, Swissquote, and Huawei

### Bachelor of Biotechnology

2017 – 2021

MSU — Lomonosov Moscow State University

Moscow, Russia

## SKILLS

**Programming Languages:** Python, JavaScript, TypeScript, SQL, MATLAB, R

**Software & Frameworks:** PyTorch, TensorFlow, React, React Native, Keras, Flask, FastAPI, Optuna, Wandb, Fiji, (La)TeX

**Libraries:** pandas, NumPy, OpenCV, scikit-learn, scikit-image, SciPy, NLTK, Diffusers

**Tools:** Git, Linux, Docker, AWS, Google Cloud, Azure, MongoDB, Firebase, Postman, Visual Studio Code