

# Aleksandr Karavaev

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T-shaped Robotics/Software Engineer with a strong core in robotics, simulation and CI/CD systems, complemented by a broad skill set in computer vision and DevOps. I like to work on important problems with like-minded people.

## SKILLS

- **Programming Languages:** Python3, C++ (14), C, Bash, Rust
- **Simulation Platforms:** Gazebo, Nvidia Isaac, Unity, Mujoco; URDF for robot modeling
- **Tools:** Git, Linux(Advanced)
- **DevOps:** Jenkins, Docker, Debian, Podman, TeamCity, GitLab CI/CD, Buildbot, Monitoring, GCloud
- **DL/ML:** Reinforcement Learning(RL), TensorFlow, PyTorch, NumPy, OpenCV, LLM, LLM APIs
- **Leadership & Team Building:** Success in assembling teams, guiding projects, and aligning with stakeholder visions in diverse environments.
- **Robot Operating System (ROS):** ROS (1/2), Middleware, DDS, PCL, BT, Navigation2, Planning, Mobile Robotics, Perception, Control, Localization, Sensor Fusion, MoveIt

## EXPERIENCE



### Senior Robotics Software Engineer

Aug 2022 - Present

Magazino GmbH, Munich, Germany

- Maintainer of the following internal components for three different robot products: Robot bring-up and middleware, robot testing libraries (both real and sim), internal developer tooling libraries, CI/CD pipelines.
- Led the design and maintenance of 3 internal simulators, empowering ~70 developers to efficiently test robots and resulting in a 25% reduction in development cycle time.
- Accomplished software stack unification, by collaborating and connecting 2 teams during our company's acquisition.
- Member of a small task-force(3 people) to migrate the whole company (~70 developers and 200+ repos) to GitLab and develop the whole buildfarm there.
- Oversaw the internal build farm and continuous integration/deployment (CI/CD) pipelines for all internal software using ROS packages. Implemented comprehensive testing protocols (unit and integration) and enhanced developer workflows, resulting in a more efficient development lifecycle.
- Engineered internal developer tools that reduced development time. Transitioned application containerization from nspawn to Podman, achieving simpler and more reliable deployments.
- Facilitated the company's migration to GCP Artifact Registry, ensuring developers had access to the latest development images.
- Integrated a test management system that resulted in reducing the number of overlapping test cases and observability for requirements.
- Maintaining and exporting robot URDF models from SolidWorks.



### Software Engineer

Jul 2020 - Apr 2022

JetBrains Techlab Museum of Future, Saint-Petersburg, Russia; Amsterdam, Netherlands  
Opening museum of the future.

- Assembled a team of 5 engineers. Deployed knowledge bases and ticketing system for the team, ensured aligned vision with stakeholders.
- Created test tasks for new people joining the company, conducted interviews while managing the right fit for the team.
- As a founding member of the Saint-Petersburg Museum of Future team, I was responsible for researching, selecting, and deploying all necessary equipment to ensure that the desired R&D projects could be developed in-house. Collaborated efficiently and effectively on projects remotely with the Techlab team in Amsterdam.
- Complete CI/CD pipeline architecting, including creating and configuring reliable agents that continually build and deploy Docker images for our ARM devices.
- Actively contributed to the development of robot vending project, employing a Rethink Robotics Sawyer manipulator. In particular, I was responsible for IK tuning, Cartesian planning, and various features required to improve the interaction experience for visitors.



### Computer Vision Engineer(Part-time)

Apr 2019 - Jul 2020

Starline, Saint-Petersburg, Russia

- Developed the lane marking clustering component prototype of HD mapping pipeline for self-driving car applications.
- Created a mobile mapping toolkit prototype as a dash-cam style device. Comprising a SBC and stereo-camera, it automatically detected and mapped all road signage in real-time.

## EDUCATION

**Master's degree(Unfinished), Machine Learning** Sep 2020 - Jun 2022  
*ITMO University Saint-Petersburg, Russia*

**Bachelor's Degree, Intellectual Robotics and Control** Sep 2016 - Jun 2020  
*ITMO University Saint-Petersburg, Russia*

## HONORS & AWARDS

**Winner of [JetBrains Annual Hackathon](#). CyberJacksonPollock project in Tangible category, JetBrains** 2021  
*Using a web UI, employees from all over the world could manipulate a robotic arm to create abstract art.*

**[MIT COVID19 Challenge](#) winner for track Energizing Healthcare.**  
**Team SCADA For Africa, MIT Remote** 2020  
*Solving rolling blackouts for Africa.*


**First place at [AI-DO driving Olympic, 2019, ICRA, Montreal](#)** 2019  
*Together with the team won the self-driving competition with small "ducks" as simulated vehicles.*

**Participant in [Junction 2019](#).** 2019  
*Hacking at the coolest hackathon.*


## ACTIVITIES

- Founded a local [Robotics community](#) with **3000+ members online** and recurring meetups around **100-200 people each**.
- From time-to-time I contribute to the **open-source** community, as I believe it is important. It truly fascinates me to see people from all over the world working together, creating things ultimately for the benefit of humanity.
- I **love to read** non-fiction books and professional literature. My [GoodReads](#).
- [Podcast](#) guest on the theme of Future Transportation. Couple of short educational [videos](#) on TikTok, where I explained some concepts of future technologies.
- Daily **meditator** (Vipassana).

## RECENT SIDE-PROJECTS

 **Foodie AI** Nov 2023 - Jan 2024  
Building a calorie tracker using only photos and AI nutritionists. I was the full-stack engineer co-founder, responsible for cloud deployment, metrics, and writing all the code.

- 400-500 MAU. Still [active](#) (Though in Russian).
- Observability implemented(exception reporting, total API costs etc.)
- Around 3-4k LOC Python.

 **Ciare** Jan 2023 - Sep 2023  
Building side-project ciare.dev during night. Idea about the product was to create the web platform to track simulation and real-life regression tests for robots based on requirements they fulfill.

- LLM Based simulation [world creator tool](#), 140+ stars on GitHub.
- Validating ideas quickly, interviewing people, hiring designers, product strategy.


## PUBLICATIONS

**"Light Invariant Lane Detection Method Using Advanced Clustering Techniques."**, CEUR. 2020  
*Karavaev, Aleksandr & Al-Naim, Rami.*

**"LEGO Mindstorms EV3 for Teaching the Basics of Trajectory Control Problem."** 2018 IEEE Frontiers in Education Conference (FIE). 2018  
*Kapitonov, Aleksandr; Antonov, Evgeniy; Artemov, Kirill; Dobriborsci, Dmitrii; Zamotaev, Egor; Karavaev, Aleksandr; Al-Naim, Rami; Souzdalev, Oleg.*

## External education

 **JASS School, Technical University Munich Munich, Germany** 2019

 **Exchange student, CS, Innopolis University, Innopolis, Russia** 2017