

Pavel Kopanev

Machine Learning Research Engineer — 3D Computer Vision & Physical AI

Abu Dhabi, United Arab Emirates

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Profile

Machine Learning and 3D Computer Vision Research Engineer with 5+ years of experience building physical AI systems, robotic manipulation capabilities, 3D perception pipelines, and high-fidelity 3D reconstruction and rendering tools for robotics, autonomous driving, and 3D content creation. Currently focused on Vision-Language-Action models for robotic manipulation, covering multimodal policy learning, robotic-data pre-training, flow-based action learning, fine-tuning, and deployment on physical humanoid hardware.

Experience

Technology Innovation Institute (TII)

Dec. 2022 – Present

Computer Vision Engineer / Lead Embodied AI Engineer, ARRC

Abu Dhabi, UAE

- Leading a 3-person team building Vision-Language-Action models for single-arm, dual-arm, mobile manipulation, and humanoid robotic platforms, spanning robotic data collection, pre-training, fine-tuning, evaluation, and real-time deployment.
- Developed a custom VLA model based on Qwen3 VL (4B) with a flow-matching action head; performed pre-training on diverse robotic data, task-specific fine-tuning, and deployment on custom humanoid hardware.
- Integrated learned policies with Cartesian impedance controllers for humanoid arms, bridging high-level VLA outputs with stable low-level manipulation control.
- Developed RGB-D perception for task-based manipulation: 6D object pose estimation, grasp sampling, motion planning, and collision avoidance for robotic arms.
- Created 6D pose estimation and point-cloud completion models for arbitrary-object manipulation, including custom datasets with transparent objects and 6D pose annotations.
- Implemented synthetic-data pipelines for harvesting and manipulation using Gaussian Splatting, Blender procedural modeling, 3D reconstruction, and Unity; contributed to ROS2 manipulation pipelines for unknown objects.

Huawei

May 2022 – Dec. 2022

Computer Vision Research Engineer, AI Foundation and Algorithm Lab

Moscow, Russia

- Contributed to multi-modal 3D object detection for autonomous driving using LiDAR, camera, and radar data, focusing on perception model development and evaluation.

Teleport (Startup)

Mar. 2021 – Dec. 2022

3D Computer Vision Engineer

Moscow, Russia

- Developed an object 3D reconstruction pipeline based on photogrammetry, neural rendering, and production-oriented capture workflows | teleport3.io.
- Built a real-time neural scene renderer and contributed to photo-to-video generation using inpainting, unsupervised segmentation, and monocular depth estimation.
- Reviewed and prototyped single-view and sparse-view 3D reconstruction approaches relevant to generative 3D content creation.

Skolkovo Institute of Science and Technology (Skoltech)

Jul. 2021 – May 2022

Research Intern, ADASE 3DDL

Moscow, Russia

- Developed visualization tools for large-scale 3D models and point clouds.
- Contributed to multi-sensor large-scale data collection for multi-view 3D reconstruction, later published at CVPR 2023.

Integrand

Feb. 2021 – Jul. 2021

3D Computer Vision Engineer, SLAM Group

Moscow, Russia

- Worked on visual and visual-inertial SLAM, with emphasis on tightly coupled inertial integration into visual SLAM pipelines.

Sberbank

Jun. 2020 – Aug. 2020

Intern, Sberbank Robotics Laboratory

Moscow, Russia

- Contributed to a systematic review of visual SLAM algorithms, later published in the Journal of Intelligent and Robotic Systems.

Technical Skills

ML / Foundation Models: PyTorch, CUDA, Hugging Face Transformers, Diffusers, Accelerate, FSDP, DDP, DeepSpeed, model fine-tuning, distributed training

VLA / Robotics Learning: Qwen, LLaMA, LLaVA, PaLI-Gemma, CLIP, Segment Anything, VLM/LLM adaptation, diffusion policies, flow-matching action learning

3D Computer Vision: RGB-D perception, 6D pose estimation, point clouds, SLAM/VIO, multi-view reconstruction, photogrammetry, neural rendering, Gaussian Splatting, synthetic data

Robotics / Deployment: ROS 1/2, MoveIt, Gazebo, Cartesian impedance control integration, manipulation pipelines, simulation-to-real workflows, real-time robot deployment

Tools / Infrastructure: Python, C++, Bash, OpenCV, Open3D, Kornia, COLMAP, OpenMVS, Trimesh, PyMesh, Blender, Unity, Unreal Engine, Docker, Kubernetes, AWS, GCP, GitLab CI/CD, Git

Education

Skolkovo Institute of Science and Technology

Sept. 2019 – Jun. 2021

M.Sc. in Information Systems and Technology, GPA 5.0/5.0

Moscow, Russia

- Thesis: Visual-Inertial SLAM for an autonomous outdoor delivery robot with tightly coupled wheel odometry and DNN-based front-end.

Bauman Moscow State Technical University

Sept. 2015 – Jun. 2019

B.Sc. in Robotics and Mechatronics, GPA 5.0/5.0

Moscow, Russia

- Thesis: Computer vision components for automating ROV docking with an underwater station.

Selected Robotics Projects

Reset - Skoltech Eurobot Team, Intelligent Space Robotics Lab

Oct. 2019 – Sept. 2020

Software Developer / Team Mentor

Moscow, Russia

- Developed localization and navigation for autonomous mobile robots; mentored the team that won the 2021 Russia Final Stage of EUROBOT.

Hydranautics - Bauman Moscow State Technical University Team

Sept. 2016 – Jan. 2020

Software Developer

Moscow, Russia

- Built computer vision, mission planning, simulation, and GUI components for ROV/AUV systems; contributed to a 4th-place result at SAUVC 2019.

Selected Publications

Generalization of Manipulation Skills using Keypoint Priors (2025)

G. Franzese, D. Sotelo, M. O. Elnour, P. Kopanev, A. Rehman, M. Asokan, D. Caporale, P. Ardón

CoRL 2025 Workshop on Generalizable Priors for Robot Manipulation | [paper](#)

T3D: Modular hardware and software complex for reconstruction of 3D objects (2025)

A. O. Zhirkov, R. O. Rodionov, P. D. Kopanev, V. A. Frolov

GraphiCon 2025, pp. 133–145 | [paper](#)

Multi-Sensor Large-Scale Dataset for Multi-View 3D Reconstruction (2023)

O. Voynov, G. Bobrovskikh, P. Karpyshev, S. Galochkin, A.-T. Ardelean, A. Bozhenko, E. Karmanova, P. Kopanev, Y.

Labutin-Rymsho, R. Rakhimov, A. Safin, V. Serpiva, A. Artemov, E. Burnaev, D. Tsetserukou, D. Zorin

CVPR 2023, pp. 21392–21403 | [paper](#)

Comparison of modern open-source Visual SLAM approaches (2023)

D. Sharafutdinov, M. Griguletskii, P. Kopanev, M. Kurenkov, G. Ferrer, A. Burkov, A. Gonnochenko, D. Tsetserukou

Journal of Intelligent and Robotic Systems 107(3), 43 | [paper](#)

DeltaCharger: Charging Robot With Inverted Delta Mechanism and CNN-Driven High Fidelity Tactile Perception for Precise 3D Positioning (2021)

I. Okunevich, D. Trinitatova, P. Kopanev, D. Tsetserukou

IEEE Robotics and Automation Letters 6(4), 7604–7610 | [paper](#)

Languages

Russian: Native **English:** Advanced / IELTS 7.5 **German:** Intermediate