Sepideh Shamsizadeh

B Work Permit, Zurich, Switzerland

sepideh.92sh@gmail.com | Sepideh.Shamsizadeh | sepideh-shamsizadeh | sepideh-shamsizadeh



HIGHLIGHTS

Perception Engineer with an MSc in AI & Robotics and research and industry experience building real-time perception systems for robots and edge devices. Co-author at ICRA 2024 on camera–LiDAR fusion for mobile robots, with hands-on work in 2D/3D object detection, segmentation, multi-object tracking (Kalman filtering, SORT) and multimodal sensor fusion. Experienced across the full pipeline: sensor data collection and calibration, training and evaluating PyTorch models (CNNs, Transformers), and optimizing them for latency-constrained deployment on embedded and edge hardware. Integrates perception into robotic stacks with ROS/ROS2 on Linux, and ships reliably with Docker, Kubernetes, Git, automated testing and CI/CD. Focused on perception that stays robust, efficient and measurable in real-world conditions.

Work Experience

Machine Learning Research Assistant — *Winterthur, Switzerland*

ZHAW Zurich University of Applied Sciences — *Sept 2024 – Aug 2026*

- Built a self-supervised multimodal learning pipeline in PyTorch for behaviour recognition from collar-mounted sensors: contrastive pretraining (SimCLR, NT-Xent) of a Conv1D–Transformer encoder on unlabeled 100 Hz IMU data from 15 devices, then fine-tuning on video-annotated windows.
- Time-aligned dense IMU with sparse GNSS and trained a late-fusion head with class-balanced sampling and MixUp, raising macro-F1 on unseen animals from 0.61 to 0.82 (leave-one-animal-out evaluation).
- Graphenova: developed CV/ML pipelines for TEM/SEM microscopy, benchmarking 15+ segmentation and detection models (incl. SAM/SAM2) and training a multi-task PyTorch CNN (EfficientNet/ResNet) that fuses images with metadata.
- Built a Flask platform for human-in-the-loop review and correction of model outputs, feeding corrected labels back into training data.
- Deployed containerized services on Linux edge–cloud infrastructure (Docker, Kubernetes, CI/CD) and optimized models for constrained devices via post-training quantization.
- Marie Skłodowska-Curie (MSCA) secondment at Nearby Computing, Barcelona (Oct–Dec 2024): developed LLM-assisted multi-agent workflows for automated Kubernetes orchestration in a distributed edge–cloud IoT platform.

Project Management – Generative AI in Insurance — *Zurich, Switzerland*

Eurapco — *Nov 2023 – Feb 2024*

- Planned and coordinated a generative-AI initiative using LLMs and knowledge graphs, from concept through prototype, in a regulated insurance environment.
- Translated requirements from technical and domain stakeholders into an implementable AI solution and communicated results to non-technical audiences.

Perception & Robotics Researcher — *Padova, Italy*

IAS-lab, University of Padova — *Sept 2022 – Sept 2023*

- Built and deployed real-time ML pipelines in Python and modern C++ on autonomous mobile robots, integrating a YOLOv7 detector with LiDAR data for detection, multi-object tracking, and localisation under latency constraints.
- Developed an automated annotation and evaluation framework for real-world data, including end-to-end camera–LiDAR calibration at ~0.15% reprojection error.
- Co-authored an ICRA 2024 paper on automatic annotation of people's positions using panoramic camera and LiDAR data.

Machine Learning – R&D Team Leader — *Tehran, Iran*

Kavosh — *Jun 2017 – Sep 2019*

- Led an R&D team developing an ML-based clinical coding assistant, including data preprocessing, feature engineering, and domain-specific Word2Vec.
- Developed and evaluated BiLSTM and attention-based models, improving prediction accuracy from 76% to 96%.
- Validated models on real-world clinical data and through shadow deployment before production rollout.

Education

MSc in Computer Engineering, AI and Robotics *Padova, Italy*
University of Padova *Sept 2020 - July 2023*

MSc in Health Information Technology *Tehran, Iran*
University of Tehran *Sept 2014 - Sept 2017*

Projects

Industrial Robot Manipulation and Grasping *Padova, Italy*
University of Padova *2022 – 2023*

- Programmed and tested pick-and-place, conveyor handling, and object sorting tasks on a physical industrial robotic arm using Adept V+.
- Implemented motion sequences using joint and Cartesian coordinates, tool frames, approach and departure movements, and gripper control.

Autonomous Mobile Manipulation with ROS *Padova, Italy*
University of Padova *2022 – 2023*

- Developed ROS-based navigation and obstacle avoidance for a mobile manipulator using Python, Gazebo, and RViz.
- Integrated QR-code recognition with robot task execution for object identification, pick-and-place, and delivery operations.

3D Reconstruction with Structure from Motion *Padova, Italy*
University of Padova *Apr 2022 – May 2022*

- Implemented a 3D reconstruction pipeline in C++ using SIFT, multi-view geometry, and bundle adjustment with Ceres Solver.

3D Semantic Segmentation with PointNet *Padova, Italy*
University of Padova *Mar 2022 – Apr 2022*

- Implemented and trained a PointNet model in Python and PyTorch for semantic segmentation of LiDAR point clouds using SemanticKITTI.
- Developed preprocessing and evaluation workflows, achieving 96% point-wise accuracy on held-out data.

Skills

Perception & Computer Vision	Object Detection (YOLO); Segmentation (SAM/SAM2, U-Net); Multi-Object Tracking (SORT); OpenCV; Point Clouds
Sensor Fusion & Robotics	Camera–LiDAR Fusion & Calibration; Kalman Filtering; Multimodal Sensor Data; ROS/ROS2; Mobile Robot Deployment
Deep Learning	PyTorch; CNNs (ResNet, EfficientNet); Transformers; Self-Supervised Learning; Training, Evaluation & Error Analysis
Edge Deployment & Optimization	ONNX; TensorRT; Quantization & Edge Inference; Cloud–Edge Orchestration; Model Serving (FastAPI)
Programming & Tools	Python (NumPy, pandas, scikit-learn); C++; Linux; Git; Automated Testing
MLOps & Infrastructure	Docker; Kubernetes; CI/CD; MLflow; Weights & Biases; Prometheus/Grafana; Monitoring & Drift Detection
Additional ML	Time-Series & LSTM Anomaly Detection; LLM-based Multi-Agent Systems; Clinical NLP

Publications

PanNote: An Automatic Tool for Panoramic Image Annotation of People's Positions
Bacchin, A., Barcellona, L., **Shamsizadeh, S.**, Olivastri, E., Pretto, A., Menegatti, E. *2024*

In: *2024 IEEE International Conference on Robotics and Automation (ICRA)*, Yokohama, Japan, 13–17 May 2024. IEEE, pp. 17006–17012. DOI: 10.1109/ICRA57147.2024.10610347.