

FRANCESCO SARNO

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Professional Experience

Computer Vision and Robotics Research Engineer Feb 2023 – Current
Switzerland Innovation Park Biel/Bienne, Swiss Battery Technology Center, Biel, CH

Created a pipeline for detection and pose estimation of EV battery components. RL applied to automated dis-assembly. Synthetic dataset creation based on Omniverse. ROS2 integration of computer vision algorithms.

Computer Vision Specialist Sep 2023 – Present
ETH Juniors, Zurich, Switzerland

Leading multiple POCs based on computer vision:

OCR for Information Extraction – Text recognition models to extract relevant data from documents.

Damage Detection & Classification – Defect identification and localization on challenging surfaces.

3D Indoor Scene Synthesis – VLMs and NVIDIA Omniverse for 3D environment generation.

OCR for Fraud Detection – OCR and ML-based feature matching to identify counterfeit gold bars.

Computer Vision Research Engineer Feb 2022 – Mar 2023
EPFL, Computer Vision Lab, Lausanne, CH

Conducted research in 3D reconstruction, GCNN, biomedical imaging, crowd-counting, SFM, and camera cali-bration.

Computer Vision Research Assistant May 2021 – Dec 2021
ETH Zürich, Computer Vision Lab, Zurich, CH

Conducted research in automated machine learning, 3D vision, and view synthesis. Concluded with two publi-cations at WACV22.

Computer Vision Engineer Aug 2021 – Dec 2021
Solera Holdings, Qapter via ETH Juniors, Zurich, CH

Developed deep learning and NeRF-based algorithms for 3D reconstruction, segmentation, and depth estimation.

Computer Vision Engineer Intern Feb 2020 – Dec 2020
Rheinmetall Air Defence, Qapter, Zurich, CH

Developed algorithms aimed at firings' accuracy evaluation and 3D visualization.

Education

M.Sc. in Robotics, Systems and Control 2018 – 2021
ETH Zürich

Advisor: Prof. Dr. Roland Siegwart

Grade: 5.61/6.00

B.Sc. in Automation Engineering 2015 – 2018
Politecnico di Milano

Grade: 106/110

High School Diploma 2010 – 2015
Liceo Scientifico Statale N. Copernico
Grade: 95/100

Selected Projects

Master's Thesis

ETH Zürich, Computer Vision Lab

Advisor: Prof. Dr. Luc Van Gool, Dr. Suryansh Kumar, Dr. Berk Kaya

Completed with distinction 5.75/6.00

Exploring Automated Machine Learning Framework for Deep Photometric Stereo: developed an automatically designed pipeline that achieves state-of-the-art results in uncalibrated photometric stereo.

Semester Project

ETH Zürich, Autonomous Systems Lab

Advisor: Prof. Dr. Roland Siegwart, Dr. Abel Gawel, Dr. Hermann Blum

Semantically informed localization in building structures: developed a pipeline for localization of a four-wheel robot in indoor environments using a segmentation-oriented neural network and point clouds.

Course Project

ETH Zürich, Computer Vision and Geometry Group

Advisor: Prof. Dr. Marc Pollefeys

Fully Convolutional Place Recognition Network: developed an algorithm for sparse SLAM with point clouds in large outdoor environments.

Course Project

ETH Zürich, Innovation Center Virtual Reality

Advisor: Prof. Dr. Andreas Kunz

AMazing videogame: created a maze-based video game from scratch, playable with keyboard and HTC VIVE.

Research Interests

Computer Vision

3D Reconstruction, View Synthesis, Photometric Stereo, Segmentation, Camera Calibration.

Robotics

Visual SLAM, State Estimation

Machine Learning

Deep Neural Networks, Deep Reinforcement Learning, Diffusion Models (T2I, T2V), Generative Models (GAN, Normalizing Flow), AutoML (Neural Architecture Search, Evolutionary learning), LLMs.

Skills

Programming Skills

Python, PyTorch, C, C++, ROS, MATLAB, C#, Unity

Language Skills

Italian (Native), English (Proficient), Spanish (Intermediate), German (Basic), French (Basic)

Publications

WACV 22 Neural Architecture Search for Efficient Uncalibrated Deep Photometric Stereo. Francesco Sarno, Suryansh Kumar, Berk Kaya, Zhiwu Huang, Vittorio Ferrari, Luc Van Gool. IEEE/CVF Winter Conference on Applications of Computer Vision, 2022, Hawaii, USA.

WACV 22 Neural Radiance Fields Approach to Deep Multi-View Photometric Stereo. Berk Kaya, Suryansh Kumar, Francesco Sarno, Vittorio Ferrari, Luc Van Gool. IEEE/CVF Winter Conference on Applications of Computer Vision, 2022, Hawaii, USA.

Certificates

ICVSS 2024 / Computer Vision in the Age of Large Language Models, 2024

IEEE RAS Summer School on Multi-Robot Systems, CTU Prague, 2022

IELTS (International English Language Testing System), Grade: 7.5, 2018

Volunteering

Core Team Member, Google Developer Student Club Zürich, Oct 2021 – Oct 2022

Football Coach, GSO Azzano Mella, Aug 2022 – Current

Volunteer, Gruppo Volontariato Primavera, Aug 2022 – Current

References

Prof. Dr. Luc Van Gool, Prof. Dr. Pascal Fua, Prof. Dr. Roland Siegwart, Prof. Dr. Suryansh Kumar, Dr. Berk Kaya, Dr. Udaranga Wickramasinghe