Davide Allegro

Ph.D. student

Date of birth: 1997-06-02
Limena, PD, Italy
✉ davide.allegro97@gmail.com
🌐 davidea97.github.io
in davide-allegro-a947a5208
Ⓢ davide allegro
� davidea97
ⓘD ORCID davide allegro

Profile Summary

I am a third-year PhD student in Computer Vision and Robotics at the Intelligent Autonomous Systems Laboratory (IASLab), within the Department of Information Engineering (DEI) at the University of Padova. I specialize in multi-camera pose estimation, including both onboard sensors for mobile robots and fixed cameras for robotic manipulation in human-robot collaboration tasks. My current research aims to unify these two scenarios by leveraging 3D features for accurate camera pose estimation and fostering effective human-robot collaboration. Additionally, I am exploring the use of open vocabulary approaches with large language models (LLMs) and 3D Gaussian Splatting techniques for 6D object pose estimation, with the goal of enhancing robot interactions with the environment.

Work Experience

Oct. 2022 - Present	**Teaching Assistant**, University of Padova. Courses: Computer Vision, C++ Programming Laboratory.
Apr. 2022 - Sep. 2022	**Research scholarship**, IASLab, University of Padova. Multi-camera hand-eye calibration to improve the efficiency in human-robot collaboration.
Feb. 2022 - Jun. 2022	**IoT Intern / Digital Academy**, Siemens, Milan, Italy. Project work on IoT for Data Analytics: designed a data acquisition system to collect energy data from a machine tool.
Jun. 2020 - Dec. 2020	**Digital Transformation Intern**, Azzurro Digitale, Padova, Italy. Developed IoT software for data acquisition in a computer vision project.

Education

Oct. 2022 - Present	**Ph.D. program in Computer Vision and Robotics**, IASLab, University of Padova. Research topic: multi-camera calibration, camera pose estimation, and 6D object pose estimation for human-robot interaction.
Oct. 2019 - April. 2022	**M.Sc. Automation Engineering**, University of Padova. Grade: 106/110. Supervisor: Stefano Ghidoni, Full Professor, University of Padova. Thesis: Automatic Multi-Camera Hand-Eye Calibration for Robotic Workcells.
Sept. 2016 - Oct. 2019	**B.Sc. in Information Engineering**, University of Padova. Grade: 101/110. Supervisor: Augusto Ferrante, Full Professor, University of Padova. Thesis: Neural Networks and Deep Learning.

Awards

- Klaus Fischer Degree Awards Edition 2023 on the theme "Innovations in processes, equipment and instrumental systems for the digitalization and automation of industrial production".
- 1st prize of ADvanced Agile ProducTion (ADAPT) field campaign competition organized by Tampere University, Finland.

Skills

- Programming Languages: C++, Python
- Typesetting: LaTeX
- Scientific Computing: Numpy, Pandas, Matplotlib, Scikit-learn
- Open-source tools: OpenCV, ROS, PyTorch, TensorFlow, Ceres-Solver
- Open-source 3D libraries: Open3D, COLMAP
- Systems: Git, Docker
- Languages: Italian (Native), English (Professional)

Reviewer

IEEE Robotics and Automation Letters, IEEE Transactions on Automation Science and Engineering, IEEE International Conference on Intelligent Robots and Systems, and IEEE International Conference on Robotics and Automation

References

Published Papers

[1] Davide Allegro, Matteo Terreran, and Stefano Ghidoni. "Multi-Camera Hand-Eye Calibration for Human-Robot Collaboration in Industrial Robotic Workcells". In: *IEEE Robotics and Automation Letters*. IEEE. 2024.

[2] Davide Allegro, Matteo Terreran, and Stefano Ghidoni. "MEMROC: Multi-Eye to Mobile RObot Calibration". In: *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE. 2024.

[3] Laura Bragagnolo, Matteo Terreran, Davide Allegro, and Stefano Ghidoni. "Multi-view Pose Fusion for Occlusion-Aware 3D Human Pose Estimation". In: *European Conference on Computer Vision*. Springer. 2024.

[4] Alberto Bacchin, Davide Allegro, Stefano Ghidoni, and Emanuele Menegatti. "SOOD-ImageNet: a Large-Scale Dataset for Semantic Out-Of-Distribution Image Classification and Semantic Segmentation". In: *European Conference on Computer Vision*. Springer. 2024.

[5] Daniele Evangelista, Emilio Olivastri, Davide Allegro, Emanuele Menegatti, and Alberto Pretto. "A Graph-Based Optimization Framework for Hand-Eye Calibration for Multi-Camera Setups". In: *2023 IEEE International Conference on Robotics and Automation (ICRA)*. IEEE. 2023.

[6] Davide Allegro, Matteo Terreran, and Stefano Ghidoni. "METRIC—Multi-Eye to Robot Indoor Calibration Dataset". In: *Information* 14.6 (2023).

[7] Daniele Evangelista, Davide Allegro, Matteo Terreran, Alberto Pretto, and Stefano Ghidoni. "An unified iterative hand-eye calibration method for eye-on-base and eye-in-hand setups". In: *2022 International Conference on Emerging Technologies and Factory Automation (ETFA)*. IEEE. 2022.

Papers Under Review

[8] Niccolò Turcato, Giulio Giacomuzzo, Matteo Terreran, Davide Allegro, Ruggero Carli, and Alberto Dalla Libera. "Robotic Object Throwing with real Manipulator using Model-Based Reinforcement Learning". In: *IEEE Transactions on Robotics*. IEEE. 2024.