Date of birth: 1997-06-02
Limena, PD, Italy
davide.allegro.1@phd.unipd.it
davidea97.github.io
davide-allegro-a947a5208
davide allegro
davidea97
ORCID davide allegro

Davide Allegro

Ph.D Student

Profile Summary

I am currently pursuing the PhD in Computer Vision and Robotics. My research is primarily focused on multi-view robot localization and camera localization for human-robot collaboration. Alongside this, I am deeply investigating human action recognition methods for enhancing human-robot interactions.

Work Experience

Oct. 2022 - Present
Teaching Assistant, University of Padova.
M.Sc. course: Computer Vision (22/23, 23/24)
B.Sc. course: C++ Programming Laboratory (22/23, 23/24).

Apr. 2022 - Sep. 2022
Research scholarship, Intelligent Autonomous Systems Laboratory, Department of Information Engineering, University of Padova.
Research topic: camera localization and calibration for human-robot interaction.
Supervisor: Stefano Ghidoni.

Feb. 2022 - Jun. 2022
IoT Intern / Digital Academy, Siemens, Milan, Italy.
Project work on IoT for Data Analytics, design of a data acquisition system to acquire energy data from a machine tool and the subsequent data anlysis with a human-machine interface.

Jun. 2020 - Dec. 2020
Digital Transformation Intern, Azzurro Digitale, Padova, Italy.
Development of IoT software for data acquisition for a computer vision project with Intel LiDAR sensor L515 and Intel depth camera D455.

Education

Oct. 2022 - Present
Ph.D. in Information Engineering, Intelligent Autonomous Systems Laboratory, Department of Information Engineering, University of Padova.
Supervisor: Stefano Ghidoni.
Research topic: Camera localization and calibration, multi-view robot localization and human action recognition for human-robot collaboration.

Oct. 2019 - April. 2022
M.Sc. Automation Engineering, University of Padova.
Grade: 106/110.
Thesis: Automatic Multi-Camera Hand-Eye Calibration for Robotic Workcells.
Supervisor: Stefano Ghidoni.

Sept. 2016 - Oct. 2019 **B.Sc. in Information Engineering**, University of Padova.
Grade: 101/110.
Thesis: Neural Networks and Deep Learning.
Supervisor: Augusto Ferrante.

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".
- 1^{st} prize of ADvanced Agile ProducTion (ADAPT) field campaign competition organized by Tampere University, Finland, in the context of the Metrics European project.

Skills

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

Reviewer

IEEE-ASME Transaction on Mechatronics 2023, IEEE-ICRA 2024

References

Published Papers

[1] 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.

[2] 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.

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

Submitted Papers

[4] 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.

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