

# Alessandro Simoni

PhD Student @ Department of Engineering “Enzo Ferrari”

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## Summary

I am a PhD Student enrolled in the International Doctorate in ICT program at the AlmageLab research group of the University of Modena and Reggio Emilia (Italy), under the supervision of Prof. Roberto Vezzani. My PhD thesis defense is expected to be in March 2024. My research activities are focused on Computer Vision and Deep Learning applied to Collaborative Robotics scenarios, more precisely in topics like 3D Object Reconstruction and 3D Human/Robot Pose Estimation. Moreover, I'm actively involved in two projects in collaboration with two different companies related to 3D Human-Centric Scene Understanding in outdoor video surveillance scenarios and 3D Vehicle Reconstruction in real-world scenarios, respectively.

## Knowledge and computer skills

<b>Programming languages</b>	Python (proficiency), C++, JavaScript
<b>Libraries and Tools</b>	PyTorch, NumPy, OpenCV, PyCharm
<b>Domains</b>	Deep Learning, 2D/3D Computer Vision, 3D Human/Robot Pose Estimation, 3D Reconstruction
<b>Spoken languages</b>	Italian mothertongue, English C1 (certified ESOL Cambridge)

## Working experiences

### AlmageLab - University of Modena and Reggio Emilia

Research grant

Modena, Italy

July 2023 - (July 2024)

**Supervisor:** Prof. Roberto Vezzani

**Project:** “AI platform with digital twins of interacting robots and people”

### AlmageLab - University of Modena and Reggio Emilia

Research grant

Modena, Italy

June 2022 - June 2023

**Supervisor:** Prof. Roberto Vezzani

**Project:** “Study of recent combinations of CNN and Vision Transformer architectures”

### AlmageLab - University of Modena and Reggio Emilia

Research grant

Modena, Italy

May 2020 - May 2022

**Supervisor:** Prof. Roberto Vezzani

**Project:** “PREVUE - Prediction of Activities and Events by Vision in an Urban Environment”

### AlmageLab - University of Modena and Reggio Emilia

Student internship for master's degree thesis

Modena, Italy

July 2019 - Feb. 2020

**Supervisor:** Prof. Rita Cucchiara

“Future urban scene generation: a deep learning approach for a 3D temporal vehicle reconstruction starting from monocular images”

## Education

### University of Modena and Reggio Emilia

PhD student - Curriculum “Computer engineering and science”

Modena, Italy

Nov. 2020 - (Mar. 2024)

**Supervisor:** Prof. Roberto Vezzani

### University of Modena and Reggio Emilia

Master's degree in computer engineering

Modena, Italy

Sep. 2017 - Feb. 2020

• GPA: 27.806/30. Final grade: 108/110

### University of Modena and Reggio Emilia

Bachelor's degree in computer engineering

Modena, Italy

Sep. 2013 - Feb. 2017

• GPA: 23.607/30. Final grade: 91/110

## Certifications

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### First Certificate in English (FCE)

Grade A (Score 180, C1), University of Cambridge ESOL Examinations

Dec. 2020

### Italian State certification exam for Engineer Profession

Association of Engineers

2021

### 4<sup>th</sup> Advanced Course on Data Science and Machine Learning (ACDL 2021)

Participation certificate with final exam

July 2021

### 16<sup>th</sup> International Computer Vision Summer School (ICVSS 2022)

Participation certificate with final exam

July 2022

### ELLIS Summer School on Large-Scale AI for Research and Industry

Participation certificate with final project (NeRF-based camera optimization)

Sept. 2023

## Additional information

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**Citizenship** Italian, German

**Travelling** Passport, B license, own car

## Selected publications

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Complete list on [Google Scholar](#).

### JOURNALS

#### Pattern Recognition Letters

A. D'Eusanio, A. Simoni, S. Pini, G. Borghi, R. Vezzani, R. Cucchiara

“Depth-based 3D human pose refinement: Evaluating the refinet framework”

Mar. 2023

#### Informatics

A. D'Eusanio, A. Simoni, S. Pini, G. Borghi, R. Vezzani, R. Cucchiara

“Multimodal hand gesture classification for the human-car interaction”

Aug. 2020

### CONFERENCES

#### 23<sup>rd</sup> International Conference on Image Analysis and Processing

D. Di Nucci, A. Simoni, M. Tomei, L. Ciuffreda, R. Vezzani, R. Cucchiara

“CarPatch: A Synthetic Benchmark for Radiance Field Evaluation on Vehicle Components”

Udine, Italy

11-15 Sept. 2023

#### 35<sup>th</sup> International Conference on Intelligent Robots and Systems + RA-L

A. Simoni, S. Pini, G. Borghi, R. Vezzani

“Semi-Perspective Decoupled Heatmaps for 3D Robot Pose Estimation from Depth Maps”

Kyoto, Japan

23-27 Oct. 2022

#### 9<sup>th</sup> International Conference on 3D Vision

A. Simoni, S. Pini, R. Vezzani, R. Cucchiara

“Multi-category mesh reconstruction from image collections”

Virtual, Online

1-3 Dec. 2021

#### 16<sup>th</sup> VISIGRAPP

A. Simoni, A. D'Eusanio, S. Pini, G. Borghi, R. Vezzani

“Improving car model classification through vehicle keypoint localization”

Virtual, Online

8-10 Feb. 2021

#### 25<sup>th</sup> International Conference on Pattern Recognition

A. Simoni, L. Bergamini, A. Palazzi, S. Calderara, R. Cucchiara

“Future urban scene generation through vehicle synthesis”

Virtual, Online

10-15 Jan. 2021

#### 8<sup>th</sup> International Conference on 3D Vision

A. D'Eusanio, A. Simoni, S. Pini, G. Borghi, R. Vezzani, R. Cucchiara

“A transformer-based network for dynamic hand gesture recognition”

Virtual, Online

25-28 Nov. 2020

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