Alessandro **Simoni**

PhD Student @ Department of Engineering "Enzo Ferrari"

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Summary

I'm a PhD student under the tutorship of Prof. Roberto Vezzani at the International Doctorate School in ICT (Unimore, Italy) with the following research topic: "Computer Vision and Artificial Intelligence for Collaborative Robotic Environments".

My main interests are in Human-centric AI and Robotics exploiting deep learning and computer vision techniques applied to the 3D world. My research skills are related to 3D pose estimation of articulated objects and 3D object reconstruction through neural rendering techniques. I am also collaborating on a project related to the 3D reconstruction of vehicles through NeRF approaches.

Knowledge and computer skills

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

Working experiences

AImageLab - University of Modena and Reggio Emilia   *Modena, Italy*
Research grant   *July 2023 - ongoing*
Supervisor: Prof. Roberto Vezzani
Project: *"AI platform with digital twins of interacting robots and people"*

AImageLab - University of Modena and Reggio Emilia   *Modena, Italy*
Research grant   *June 2022 - June 2023*
Supervisor: Prof. Roberto Vezzani
Project: *"Study of recent combinations of CNN and Vision Transformer architectures"*

AImageLab - University of Modena and Reggio Emilia   *Modena, Italy*
Research grant   *May 2020 - May 2022*
Supervisor: Prof. Roberto Vezzani
Project: *"PREVUE - Prediction of Activities and Events by Vision in an Urban Environment"*

AImageLab - University of Modena and Reggio Emilia   *Modena, Italy*
Student internship for master's degree thesis   *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   *Modena, Italy*
PhD student - Curriculum "Computer engineering and science"   *Nov. 2020 - ongoing*
Supervisor: Prof. Roberto Vezzani

University of Modena and Reggio Emilia   *Modena, Italy*
Master's degree in computer engineering   *Sep. 2017 - Feb. 2020*
- GPA: 27.806/30. Final grade: 108/110

University of Modena and Reggio Emilia   *Modena, Italy*
Bachelor's degree in computer engineering   *Sep. 2013 - Feb. 2017*
- GPA: 23.607/30. Final grade: 91/110

Certifications

First Certificate in English (FCE)
Grade A (Score 180), University of Cambridge ESOL Examinations *Dec. 2020*

4th **Advanced Course on Data Science and Machine Learning (ACDL 2021)**
Participation certificate with final exam *July 2021*

16th **International Computer Vision Summer School (ICVSS 2022)**
Participation certificate with final exam *July 2022*

Selected publications

Complete list on Google Scholar.

JOURNALS

Pattern Recognition Letters (PRL)
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*

IEEE Robotics and Automation Letters (RA-L)
A. Simoni, S. Pini, G. Borghi, R. Vezzani
"Semi-Perspective Decoupled Heatmaps for 3D Robot Pose Estimation from Depth Maps" *Oct. 2022*
The paper was presented during **IROS 2022** conference held in Kyoto, Japan.

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

23rd **International Conference on Image Analysis and Processing** *Udine, Italy*
D. Di Nucci, A. Simoni, M. Tomei, L. Ciuffreda, R. Vezzani, R. Cucchiara
"CarPatch: A Synthetic Benchmark for Radiance Field Evaluation on Vehicle Components" *11-15 Sept. 2023*

9th **International Conference on 3D Vision** *Virtual, Online*
A. Simoni, S. Pini, R. Vezzani, R. Cucchiara
"Multi-category mesh reconstruction from image collections" *1-3 Dec. 2021*

16th **VISIGRAPP** *Virtual, Online*
A. Simoni, A. D'Eusanio, S. Pini, G. Borghi, R. Vezzani
"Improving car model classification through vehicle keypoint localization" *8-10 Feb. 2021*

25th **International Conference on Pattern Recognition** *Virtual, Online*
A. Simoni, L. Bergamini, A. Palazzi, S. Calderara, R. Cucchiara
"Future urban scene generation through vehicle synthesis" *10-15 Jan. 2021*

8th **International Conference on 3D Vision** *Virtual, Online*
A. D'Eusanio, A. Simoni, S. Pini, G. Borghi, R. Vezzani, R. Cucchiara
"A transformer-based network for dynamic hand gesture recognition" *25-28 Nov. 2020*

Additional information

Citizenship Italian, German
Travelling Passport, B license, own car