Andrea **Conti**

08 January 1996 *Florence, Italy*

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Education

PhD in Computer Science and Engineering

Bologna, Italy

Alma Mater Studiorum — *November 2021 - now*

- 3D reconstruction leveraging one or more RGB frames and sparse depth information by means of deep learning approaches in real use-case scenarios
- Funded by Sony DepthSensing Solutions
- Main themes: 3D Sensing, Deep Learning, Sensors Fusion
- Supervisor: Prof. Stefano Mattoccia
- Assistant Supervisors: Valerio Cambareri (Sony DepthSensing Solutions NV), Matteo Poggi (UniBo), Paolo Bellavista (UniBo)

Master's Degree in Computer Engineering, 110/110 cum laude

Bologna, Italy

Alma Mater Studiorum — *September 2018 - Dicember 2020*

- Final thesis project "*Diving between depth prediction and depth completion*" focused on the application of deep neural networks to the monocular perception of depth with the optional support of lidar sensors.
- Main themes: Deep Learning, LIDAR sensors, Depth Prediction, Depth Completion
- Supervisor: Prof. Stefano Mattoccia
  Assistant supervisors: Matteo Poggi, Filippo Aleotti, Fabio Tosi

Bachelor Degree in Computer Engineering, 110/110 cum laude

Bologna, Italy

Alma Mater Studiorum — *September 2015 - October 2018*

- Final thesis project "*Confidence Measurements for Embedded Systems relying on Machine Learning*" focused on the application of artificial intelligence techniques to the prediction of the confidence of disparity maps taking into account efficiency.
- Main themes: Machine Learning, Depth Prediction, Decision Trees
- Supervisor: Prof. Stefano Mattoccia
  Assistant supervisors: Matteo Poggi, Fabio Tosi

Research Activity

Research Topics

The primary research focus is on **3D reconstruction** utilizing deep learning and machine learning techniques with various input sources in challenging real-world environments. This encompasses extensive expertise in **stereo vision**, **multi-view stereo**, **sensor fusion** with **active sensors**, and **optical flow**.

Publications

Range-Agnostic Multi-View Depth Estimation With Keyframe Selection — *Davos, Switzerland*

International Conference on 3D Vision (3DV) — *March 2024*

A. Conti, M. Poggi, V. Cambareri, S. Mattoccia

Revisiting Depth Completion from a Stereo Matching Perspective for Cross-Domain Generalization — *Davos, Switzerland*

International Conference on 3D Vision (3DV) — *March 2024*

L. Bartolomei, M. Poggi, A. Conti, F. Tosi, S. Mattoccia

Active Stereo Without Pattern Projector — *Paris, France*

IEEE/CVF International Conference on Computer Vision (ICCV) — *October 2023*

L. Bartolomei, M. Poggi, F. Tosi, A. Conti, S. Mattoccia

Boosting Multi-Modal Unsupervised Domain Adaptation for LiDAR Semantic Segmentation by Self-Supervised Depth Completion — *Journal*

IEEE Access, Vol. 11, pp. 85155-85164 — *August 2023*

A. Cardace, A. Conti, P. Z. Ramirez, R. Spezialetti, S. Salti and L. D. Stefano

Sparsity Agnostic Depth Completion — *Waikoloa, Hawaii*

IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) — *January 2023*

A. Conti, M. Poggi, S. Mattoccia

Unsupervised confidence for LiDAR depth maps and applications — *Kyoto, Japan*

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) — *October 2022*

A. Conti, M. Poggi, F. Aleotti, S. Mattoccia

Multi-View Guided Multi-View Stereo *Kyoto, Japan*
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) *October 2022*
M. Poggi*, A. Conti*, S. Mattoccia. *joint authorship

Monitoring social distancing with single image depth estimation *Journal*
IEEE Transactions on Emerging Topics in Computational Intelligence (TETCI) *April 2022*
A. Mingozzi, A. Conti, F. Aleotti, M. Poggi, S. mattoccia

On Deployment of Out-of-the-Box Embedded Devices for Self-Powered River Surface Flow Velocity Monitoring at the Edge *Journal*
MDPI Applied Science *May 2021*
A. H. Livoroi, A. Conti, L. Foianesi, F. Tosi, F. Aleotti, M. Poggi, F. Tauro, E. Toth, S. Grimaldi and S. Mattoccia

Partecipation in Conferences

Prizes

Outstanding Reviewer at CVPR *2024*
Acknowledged as being among the top 2% of reviewers, as evaluated by the Area Chairs, out of a total of 9,872 reviewers. This recognition was awarded in appreciation of the high-quality and insightful reviews provided, demonstrating a commitment to academic rigor and contributing to the advancement of knowledge within the field.

Presentations

IEEE/CVF International Conference on Computer Vision (ICCV) *Paris, France, 2023*
IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) *Waikoloa, Hawaii, 2023*
IEEE/RSJ International Conference on Intelligence Robots and Systems (IROS) *Kyoto, Japan, 2022*

Reviewing Service

IEEE/CVF International Conference on Computer Vision (ICCV) *2023*
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) *2022 - 2023 - 2024*
IEEE/RSJ International Conference on Intelligence Robots and Systems (IROS) *2022 - 2023*
European Conference on Computer Vision (ECCV) *2022 - 2024*

Experience

Research Fellowship *Bologna, Italy*
Alma Mater Studiorum *March 2021 - November 2021*
- Research grant as part of the *Alma Value - Proof of Concept* program for the enhancement of Alma Mater patents
- Funded by the Ministry of Economic Development (MISE)
- Research project focused on exploiting the possibility of improving the depth maps obtainable from one or more standard cameras by exploiting the availability of scattered depth data, for example but not necessarily provided by an active depth sensor
  Supervisor: Stefano Mattoccia

Tutor Activity - Electronic Calculators *Bologna, Italy*
Alma Mater Studiorum *September 2021 - September 2024*
- The tutoring aims to offer extra help and enhance comprehension of the key concepts taught in the Electronic Calculators course, allowing students to understand the principles and practical uses of electronic computers, which are essential for their studies in computer engineering

Tutor Activity - Fundamentals of Computer Science *Bologna, Italy*
Alma Mater Studiorum *February 2021 - September 2021*
- The tutoring activity aims to provide additional support and deepen the understanding of the core concepts covered in the Fundamentals of Computer Science course. This will help students to grasp the fundamental principles of computer science essential for their mechatronic engineering studies.

Skills and Background Knowledge

Computer Vision & Deep Learning Tools
- Advanced knowledge of multi-view geometry and related tasks like stereo vision, multi-view stereo and optical flow, as well as common issues and common solutions
- Good nowledge of the mainstream tools for deep learning development: Pytorch, Pytorch Lightning, Tensorflow, Keras, JAX
- Other tools and technologies for visualization and machine learning other than deep learning in Python NumPy, SciPy, Pandas, Scikit-Learn, Seaborn, Matplotlib, Scikit-Image, MlFlow, WanDB, Numba

DevOps & systems administration
- Good knowledge unix system administration tools, scripting languages such as *Bash* and *Fish*, tools like *ssh*, *tmux*, *openvpn*, *iptables*)
- Good knowledge of virtualization tools such as virtual machines and *Docker*
- Excellent knowledge of *Git*

Software Engineering
- Deep mastery of Python programming, concepts and underlying mechanisms
- Knowledge of various programming paradigms studied in a heterogeneous set of programming languages: imperative programming, object-oriented programming (Python, Java, C), functional programming (Haskell, Elixir, Clojure) and message-passing programming (Elixir and Golang).

Languages
- **Italiano** native language.
- **English** fluent writing and reading, good speaking skills (B2 certificate).

Other Activities

Schools Attended

Deep Learning and Computer Vision School — *Genova, Italy*
Francesca Odone, Noceti Nicoletta — *July 2023*

Advanced Methods for Mathematical Image Analysis — *Bologna, Italy*
Luca Caltroni (CNRS), Jacek Gondzio (U. Edinburg), Ozan Oktem (KTH), Samuli Siltaten (U. Helsinki) — *January 2023*

Bertinoro International Spring School — *Bertinoro, Italy*
Marco Gori (U. Siena), Aristides Gionis (KTH), Massimo Villari (U. Messina) — *March 2022*

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I hereby authorize the use of my personal data in compliance with the Reg. UE 2016/679.