Andrea **Conti**

08 January 1996 - Computer Vision PhD - Florence, Italy

(+39) 338 1382564 - andrea.conti35@unibo.it - andreaconti.github.io - andreaconti - andrea–conti

Education

PhD in Computer Science and Engineering *Alma Mater Studiorum, Bologna, Italy, 2021 - 2024*

Deep 3D sensing with RGB and sparse depth data in real use-case scenarios. Funded by Sony DepthSensing Solutions

Master's Degree in Computer Engineering, 110/110 cum laude *Alma Mater Studiorum, Bologna, Italy, 2018 - 2020*

Thesis project on the application of deep frameworks to monocular depth perception with the optional support of lidar sensors

Bachelor Degree in Computer Engineering, 110/110 cum laude *Alma Mater Studiorum, Bologna, Italy, 2015 - 2018*

Thesis project on the application of AI to disparity maps confidence prediction taking into account efficiency for embedded scenarios

Research Activity

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

Depth on Demand: Streaming Dense Depth from a Low Frame Rate Active Sensor	*ECCV 2024, Milan, Italy*
LiDAR-Event Stereo Fusion with Hallucinations	*ECCV 2024, Milan, Italy*
Range-Agnostic Multi-View Depth Estimation With Keyframe Selection	*3DV 2024, Davos, Switzerland*
Revisiting Depth Completion from a Stereo Matching Perspective for Cross-Domain Generalization	*3DV 2024, Davos, Switzerland*
Active Stereo Without Pattern Projector	*ICCV 2023, Paris, France*
Boosting Multi-Modal Unsupervised Domain Adaptation for LiDAR Semantic Segmentation ...	*IEEE Access 2023*
Sparsity Agnostic Depth Completion	*WACV 2023, Waikoloa, Hawaii*
Unsupervised confidence for LiDAR depth maps and applications	*IROS 2022, Kyoto, Japan*
Multi-View Guided Multi-View Stereo	*IROS 2022, Kyoto, Japan*
Monitoring social distancing with single image depth estimation	*IEEE TETCI 2022*
On Deployment of Out-of-the-Box Embedded Devices for Self-Powered River Surface Flow Velocity	*MDPI 2021*

Honors and Contributions

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 at Conferences *2022 - 2024*

Presentations at major conferences in computer vision and robotics: 3DV 2024 Davos, ICCV 2023 Paris, WACV 2023 Waikoloa, IROS 2022 Kyoto

Reviewing Service *2022 - 2024*

Reviewing service at the major computer vision and robotics conferences ICCV 2023, CVPR 2022, CVPR 2023, CVPR 2024, IROS 2022, IROS 2023, ECCV 2022 and ECCV 2024.

Experience

Research Fellowship *Alma Mater Studiorum, Bologna, Italy, 2021*

Awarded a research grant by MISE under the *Alma Value - Proof of Concept* program to enhance Alma Mater patents. Conducted a project on improving depth maps from standard cameras using scattered depth data.

Tutor Activity - Electronic Calculators *Alma Mater Studiorum, Bologna, Italy, 2021 - 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 *Alma Mater Studiorum, Bologna, Italy, 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 knowledge 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 of 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 by MaLGa UniGe	*Genova, Italy, 2023*
Advanced Methods for Mathematical Image Analysis	*Bologna, Italy, 2023*
Bertinoro International Spring School	*Bertinoro, Italy, 2022*

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