Andrea **Conti**

PhD Student · Computer Science and Engineering

08 January 1996 *Florence, Italy*

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

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 NV
- PhD Committee: Stefano Mattoccia (Supervisor), Matteo Poggi, Valerio Cambareri (Sony Depthsensing Solutions NV), Paolo Bellavista

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

Bologna, Italy

Alma Mater Studiorum *September 2018 - Dicember 2020*

- Focused on artificial intelligence and computer vision
- 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: Dott. Matteo Poggi, Dott. Filippo Aleotti, Dott. Fabio Tosi

Bachelor Degree in Computer Engineering, 110/110 cum laude

Bologna, Italy

Alma Mater Studiorum *September 2015 - October 2018*

- Final thesis project "*Misure di confidenza basate su machine learning per sistemi embedded*" focused on the application of artificial intelligence techniques to the prediction of the confidence of depth maps taking into account efficiency.
- Main themes: Machine Learning, Depth Prediction, Decision Trees
- Supervisor: Prof. Stefano Mattoccia
  Assistant supervisors: Dott. Matteo Poggi, Dott. Fabio Tosi

Research Activity

Research Topics

My main research topic concerns **3D reconstruction** by means of **deep learning** and machine learning approaches with different input sources in challenging real use-case environments. This includes deep knowledge of **stereo vision**, **multi-view stereo**, **sensor fusion with active sensors** and **optical flow** as well.

Pubblications

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

Reviewing Service

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

Presentations at Conferences

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

Experience

Research Fellow *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

Teaching Tutor *Bologna, Italy*
Alma Mater Studiorum *September 2021 - September 2024*
- Tutoring activity related to the class *Calcolatori Elettronici* of the Bachelor degree in Computer Engineering

Teaching Tutor *Bologna, Italy*
Alma Mater Studiorum *February 2021 - September 2021*
- Tutoring activity related to the class *Fondamenti di Informatica* P-2 of the Mechatronic Engineering course

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 state-of-the-art solutions
- Advanced knowledge of the mainstream tools for deep learning development
  - Pytorch, Pytorch Lightning (Advanced)
  - Tensorflow, Keras (Intermediate)
  - JAX (Beginner)
- 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 the instruments used to administrate unix systems
  - scripting languages such as *Bash* and *Fish*
  - remote access tools such as *ssh*, *tmux*, *openvpn*
  - monitoring tools and firewalls (*snmp*, *iptables*, *rsyslog*)
- Excellent knowledge of virtualization tools such as virtual machines and *Docker*
- Great knowledge of *Git*

Software Engineering

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

Authorization to process personal data

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