Alessio **Tonioni**

VISITING RESEARCHER AT GOOGLE ZURICH

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Working Experience

Google
RESEARCH SCIENTIEST

Zurich, Switzerland
Dec. 2020 - Present

- Working on how to apply deep learning technologies to google products that leverage on computer vision.
- **Manager:** Federico Tombari

Google
VISITING RESEARCHER

Zurich, Switzerland
Jul. 2019 - Dec. 2020

- Worked on how to apply deep learning technologies to google products for AR. Continued my research activity on related topics (i.e., domain adaptation/generalization, model optimization, dataset creation…)
- **Manager:** Federico Tombari

University of Bologna(UNIBO)
RESEARCH FELLOW AT COMPUTER VISION LABORATORY

Bologna, Italy
Jan. 2019 - Jun. 2019

- Winner of 1 year post-doc research position in computer vision on few shot object detection and recognition.
- **Supervisor:** Luigi Di Stefano

Education

University of Bologna
PH.D. STUDENT IN COMPUTER SCIENCE AND ENGINEERING

Bologna, Italy
Nov. 2015 - Nov. 2018

- Winner of a scholarship sponsored by Centro Studi S.R.L. for a three years research project on the use of computer vision techniques in retail and wholesale stores.
- **Supervisor:** Luigi Di Stefano

University of Oxford
VISITING STUDENT

Oxford, England
May. 2018 - Nov. 2018

- Six months internship in Torr Vision Group, working on depth estimation for autonomous driving under the StreetWise grant.
- **Supervisor:** Philip Torr

University of Bologna
MASTER DEGREE IN COMPUTER ENGINEERING

Bologna, Italy
2013 - 2015

- **Final Rank:** 110/110 with honors
- **Master Thesis:** *Automatic learning of multi-scale 3D keypoint detector.*
- **Supervisor:** Luigi Di Stefano.
- **Co-supervisors:** Federico Tombari and Samuele Salti.

University of Bologna
BACHELOR DEGREE IN COMPUTER ENGINEERING

Bologna, Italy
2010 - 2013

- **Final Rank:** 110/110 with honors
- **Thesis:** *Study and implementation of algorithms for the 3D reconstruction of rooms and the automatic navigation of autonomus drone* - `http://youtu.be/VlBQLbmc03g`
- **Supervisor:** Lorenzo Marconi.
- **Co-supervisors:** Roberto Naldi and Michele Furci.

ADDITIONAL COURSES AND SCHOOLS

- **International Computer Vision Summer School**, July 2016, University of Catania
- **Regularization techniques for machine learning (Summer School)**, June 2016, Dibris, Istituto Italiano di Tecnologia, University of Genova.
- **Machine Learning Crash Course (Summer School)**, June 2015, Dibris, Istituto Italiano di Tecnologia, University of Genova.

Teaching Experience

Specialvideo and Fondazione Aldini Valeriani   *Bologna, Italy*
CORPORATE TRAINER ON MACHINE LEARNING   *Feb. 2018 - PRESENT*
- Teacher of a 16 hours corporate training course in machine/deep learning.

University of Bologna   *Bologna, Italy*
ACADEMIC TUTOR   *Sept. 2016 - sept. 2018*
- Tutor of the Computer Vision and Image Processing M course.

Publications

During my Ph.D., I have worked on the detection and recognition of products exposed on grocery store shelves and on the estimation of the 3D structure of a scene from RGB images. Then I focused on the more general problem of domain adaptation and multi task learning. Those and others projects resulted in some scientific publications I have co-authored.

A Divide et Impera Approach for 3D Shape Reconstruction from Multiple Views   *International Conference on 3D vision - Oral*

SPEZIALETTI R., TAN D. J., TONIONI A., TATENO K. AND TOMBARI F.   *2020*
- **Paper:** `https://arxiv.org/abs/2011.08534`

Learning Across Tasks and Domains   *International Conference on Computer Vision*

ZAMA RAMIREZ P., TONIONI A., SALTI S. AND DI STEFANO L.   *2019*
- **Paper:** `https://arxiv.org/pdf/1904.04744.pdf`
- **Code:** `https://github.com/CVLAB-Unibo/ATDT`

Unsupervised Domain Adaptation for Depth Prediction from Images   *Transactions on Pattern Analysis and Machine Intelligence*

TONIONI A., POGGI M., MATTOCCIA S. AND DI STEFANO L.   *2019*
- **Paper:** `https://arxiv.org/pdf/1909.03943.pdf`
- **Code:** `https://github.com/CVLAB-Unibo/Unsupervised_Depth_Adaptation`

Learning to Adapt for Stereo   *IEEE Conference on Computer Vision and Pattern Recognition*

TONIONI A., JOY T., RAHANAMA O., DI STEFANO L., AJANTHAN T., TORR P.   *2019*
- **Paper:** `https://arxiv.org/pdf/1904.02957.pdf`
- **Code:** `https://github.com/CVLAB-Unibo/Learning2AdaptForStereo`

Semi-Automatic Labeling for Deep Learning in Robotics   *IEEE Transactions on Automation Science and Engineering*

DE GREGORIO D., TONIONI A., PALLI G. AND DI STEFANO L.   *2019*
- **Paper:** `https://arxiv.org/pdf/1908.01862.pdf`

Domain invariant hierarchical embedding for grocery products recognition   *Computer Vision and Image Understanding*

TONIONI A. AND DI STEFANO L.   *2019*
- **Paper:** `https://doi.org/10.1016/j.cviu.2019.03.005`

Real-time self-adaptive deep stereo

Tonioni A., Tosi F., Poggi M., Mattoccia S. and Di Stefano L.
- **Paper:** `https://arxiv.org/abs/1810.05424`
- **Code:** `https://github.com/CVLAB-Unibo/Real-time-self-adaptive-deep-stereo`

Real-Time Highly Accurate Dense Depth on a Power Budget using an FPGA-CPU Hybrid SoC

Rahnama O., Cavallari T., Golodetz S., Tonioni A., Joy T., Di Stefano L., Walker S., and Torr P.
- **Paper:** `https://ieeexplore.ieee.org/document/8681073`

Exploiting semantics in adversarial training for image-level domain adaptation

Ramirez P. Z., Tonioni A. and Di Stefano L.
- **Paper:** `https://arxiv.org/pdf/1810.05852.pdf`

A deep learning pipeline for product recognition in store shelves

Tonioni A., Serra E. and Di Stefano L.
- **Paper:** `https://arxiv.org/pdf/1810.01733.pdf`

Unsupervised Adaptation for Deep Stereo

Tonioni A., Poggi M., Mattoccia S., Di Stefano L.
- **Paper:** `https://vision.disi.unibo.it/~mpoggi/papers/iccv2017_adaptation.pdf`
- **Code:** `https://github.com/CVLAB-Unibo/Unsupervised-Adaptation-for-Deep-Stereo`

Learning to Detect Good 3D Keypoints

Tonioni A., Salti S., Tombari F., Spezialetti R., Di Stefano L.
- **Paper:** `https://link.springer.com/article/10.1007/s11263-017-1037-3`
- **Code:** `https://github.com/CVLAB-Unibo/Keypoint-Learning`

Learning confidence measures in the wild.

Tosi, F., Poggi, M., Mattoccia, S., Tonioni, A., and Di Stefano, L.
- **Paper:** `https://vision.disi.unibo.it/~mpoggi/papers/bmvc2017.pdf`

Product Recognition on store shelves as a subgraph isomorphism problem

Tonioni A., Di Stefano L.
- **Paper:** `https://arxiv.org/pdf/1707.08378.pdf`

Skills

Programming skills

https://github.com/AlessioTonioni
- **Main programming languages**: Python, C++, C#, C, Java.
- **Machine learning frameworks used**: TesorFlow, PyTorch and Caffe on linux environment.
- **Other frameworks and libraries**: OpenCV, PCL, Ros.
- **Side Projects**: I developed during 2013/14 **"Blam!"**, a user powered comic strip aggregator for windows phone.

Language

- **Italian**: mother tongue.
- **English**: C1.
- **German**: A1.