Curriculum Vitae

Personal Information

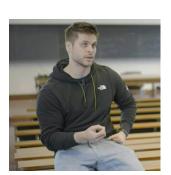|	
Name	Fabio Tosi, PhD
Date of Birth	*October 3rd, 1992*
Citizenship	*Italian*
Address	Viale del Risorgimento 2, 40136, Bologna
Email	fabio.tosi5@unibo.it (primary)
	fabio.tosi92@gmail.com (secondary)
Website	https://fabiotosi92.github.io/
Code	https://github.com/fabiotosi92
Google Scholar	https://scholar.google.com/citations?user=5-UOaQkAAAAJ&hl=it
ResearchGate	https://www.researchgate.net/profile/Fabio_Tosi
Scopus	https://www.scopus.com/authid/detail.uri?authorId=57195938366
Semantic Scholar	https://www.semanticscholar.org/author/F.-Tosi/121670758
DBLP	https://dblp.org/pid/205/3975.html
ORCID	https://orcid.org/0000-0002-6276-5282
ASN (09/H1, II Fascia)	https://asn21.cineca.it/pubblico/miur/esito/09%252FH1/2/4

Research Area and Expertises

Keywords	Machine Learning, Deep Learning, Computer Vision and 3D sensing, Image Processing
Research Themes	As a computer vision and deep learning researcher, my work has focused on the development of advanced methods for 3D reconstruction, with particular emphasis on stereo and monocular image processing. My research also includes depth uncertainty estimation using deep learning, robust multispectral image matching techniques, and the integration of active depth sensors. More recently, I have been exploring neural radiance fields to address complex challenges in novel view synthesis, 3D surface reconstruction, and SLAM.

Education

03/2020-11/2020	**Visiting Ph.D.** student (https://avg.is.mpg.de/person/ftosi) @ *Max Planck Institute for Intelligent System and University of Tübingen* - Autonomous Vision Group *(Tübingen, Germany)* Topic: *"Active Multi-view Stereo"* Supervisor: Prof. Dr.-Ing. Andreas Geiger
2017 – 2020	**Ph.D.** in Computer Science and Engineering *(Bologna, Italy)* *Commission Judgment: Excellent (5.0/5.0)* PhD Thesis: *"Deep-learning for 3D reconstruction"* approved after examination by Dr. Sean Ryan Fanello and Prof. Seungryong Kim Thesis available at: http://amsdottorato.unibo.it/9816/ **Best PhD Thesis Award**, Italian Association for Computer Vision Research (**CVPL 2022**) Supervisor: Prof. Stefano Mattoccia
2014 – 2017	**Master Degree** in Computer Science and Engineering *(Bologna, Italy)* *110L/110 - Magna cum Laude* Thesis: *"Confidence measures and depth map refinement algorithms"* Advisors: Prof. Stefano Mattoccia, Dr. Matteo Poggi
2011 – 2014	**Bachelor Degree** in Computer Science and Engineering *(Bologna, Italy)* Thesis: *"Refinement techniques for depth data generated by a stereo vision system"* Supervisor: Prof. Stefano Mattoccia

Academic Position

2023 - Present	**Junior Assistant Professor (RTDA)** @ Department of Computer Science and Engineering (DISI), University of Bologna (Bologna, Italy)
2021 – 2023	**Postdoctoral Researcher** @ Department of Computer Science and Engineering (DISI), University of Bologna (Bologna, Italy)
2017 – 2021	**PhD Student** @ Department of Computer Science and Engineering (DISI), University of Bologna (Bologna, Italy)
Apr 2017 – Oct 2017	**Research Fellow** @ Building and Construction Interdepartmental Center for Industrial Research (CIRI), University of Bologna (Bologna, Italy)

Academic Qualifications

2023	**Italian National Scientific Qualification (ASN)** – Associate Professor (09/H1, Sector: Information Processing Systems, II Level), Competitive Sector 09/H1 – II Tier – Fourth Evaluation Period, Validity: February 6, 2023 – February 6, 2034

Memberships Of Scientific Societies

2022-Present	**CVPL Member**, Italian Association for Computer Vision Research (CVPL)
2017-Present	**IEEE Member**, Institute of Electrical and Electronics Engineers (IEEE)

Institutional Responsibilities

2023-Present	**PhD Co-Supervisor**, (1 PhD Student), University of Bologna
2021	**Principal Investigator (PI)**, Proof of Concept d'Ateneo, PoC UNIBO 3rd edition
2017 - 2023	**Student Co-Supervisor**, (>13 students), University of Bologna, (non-exhaustive list)

Editorial Duties

Journals

2024-Present	**Associate Editor**, Pattern Recognition (Elsevier) (https://www.sciencedirect.com/journal/pattern-recognition/about/editorial-board) - Ranked #13 in Computer Science Journals, Impact Factor: 7.5, CiteScore: 14.4, handling 20+ paper reviews annually in Machine Learning and Pattern Recognition.
2021-Present	**Member of the Editorial Board**, Remote Sensing (MDPI) (https://www.mdpi.com/journal/remotesensing) - Impact Factor: 4.2, CiteScore: 8.3, contributing to the editorial direction of the Special Issue "Multi-Sensor Systems and Data Fusion in Remote Sensing".

Conferences

2025	**Associate Editor**, IEEE/RAS International Conference on Intelligent Robots and Systems (IROS 2025) (http://www.iros25.org/) - GGS Rating: A+, CORE: A, LiveSHINE: A+, MA: A++, acceptance rate <45% with 3000+ annual submissions
2025	**Area Chair**, International Conference on Image Analysis and Processing (ICIAP 2025) (https://sites.google.com/view/iciap25) - GGS Rating: B, LiveSHINE: B, MA: B, scientific chair for the "Embedded Vision" and "Multiview Geometry and 3D Computer Vision" tracks.

Research Projects & Fellowship

03/2023 – 10/2023	**Postdoctoral Researcher** @ Department of Computer Science and Engineering (DISI), University of Bologna (Bologna, Italy)
	Fund Manager & Supervisor: Stefano Mattoccia

Research Topic: The proposed research aims to develop deep learning-based methodologies for 3D scene reconstruction from one or multiple images using active sensors such as time-of-flight or LIDAR. The study addresses the limitations associated with estimating depth from non-Lambertian surfaces, thin objects, and high-resolution images. The research also focuses on developing techniques that can be executed on low-power and mobile devices. In addition, the study investigates methods for training proposed networks that do not require depth annotations, which are expensive to obtain, and preferably self-supervised.

Work Plan:
- Preliminary study of literature and identification of critical issues related to the problem to be solved.
- Definition of the most suitable hardware and software architectures for the research activity outlined.
- Implementation and validation of proposed methodologies on well-known datasets in literature with or without the use of active sensors.
- Development of a validation prototype to perform field tests with data acquired from cameras and suitable sensors.

02/2022 – 02/2023   **Postdoctoral Researcher** @ Department of Computer Science and Engineering (DISI), University of Bologna (Bologna, Italy) - **Principal Investigator (PI)**

Funding: PoC UNIBO 3rd edition

Role: Principal Investigator (PI)

Fund Manager: Dr. Matteo Poggi

Research Topic: Development and validation of patented technology for adapting a neural network capable of estimating depth from stereo images to unknown and very different environments. Implementation on high-end GPU-equipped desktop PCs and study of real-time execution from a theoretical point of view. Aim to create a functioning prototype and advance to a TRL of at least 6. Explore possible upgrades to the technology, such as increasing the robustness and accuracy of the depth estimation process in challenging conditions or integrating the technology with other sensors or systems.

Objectives:
- Develop a functioning prototype
- Advance to a TRL of at least 6
- Explore upgrades to the technology

Expected Outcomes: Functioning prototype, advancement to a TRL of at least 6, exploration of technology upgrades.

02/2021 – 02/2022   **Postdoctoral Researcher** @ "Department of Computer Science and Engineering (DISI)" *(Bologna, Italy)*

Funding: Huawei Technologies Co. Ltd.

Advisors: Prof. L. Di Stefano, Prof. S. Mattoccia, Dr. M. Poggi, Prof. S. Salti

Collaborator: Dr. Pierluigi Zama Ramirez

Research Topic: Developed a new core technology for accurately registering two images captured by different modalities, such as an RGB and a multi-spectral (MS) sensor, using self-supervised deep learning techniques. The technology estimated the optical flow field between the images by finding a 2D vector field that mapped pixels from one image to the corresponding pixels in the other.

Scientific Deliverables: The following is a list of the scientific deliverables produced in the project. These deliverables include flow estimation methods for different sensor combinations, a live demo of flow estimation, a feasibility study report, an on-line adaptive flow estimation method, evaluation methodologies and acquisition setup definition, a large annotated dataset with ground truth, and a protocol for evaluating the performance of developed methodologies:

- D.1.1: Flow estimation method for heterogeneous RGB sensors
- D.1.2: Flow estimation method for an RGB and a multi-spectral (MS) camera
- D.1.3: Live demo of flow estimation from heterogeneous RGB sensors
- D.1.4: Feasibility study report on flow estimation from RGB and event-based cameras
- D.1.5: On-line adaptive flow estimation method from an RGB camera and a MS sensor
- D.2.1: Evaluation methodologies and acquisition setup definition
- D.2.2: Large annotated dataset with ground truth
- D.2.3: Protocol for evaluating performance of developed methodologies

Papers and Code: In this project, a total of 4 papers were published at the CVPR and 3DV conferences. One of these papers received the best honorable mention award at the 3DV 2021 conference. The associated code for these papers is available at the following links:

- https://cvlab-unibo.github.io/booster-web/
- https://cvlab-unibo.github.io/rgb-ms-web/
- https://github.com/CVLAB-Unibo/neural-disparity-refinement
- https://cvlab-unibo.github.io/xnerf-web/

04/2017 – 11/2017   **Research Fellow** @ "Building and Construction Interdepartmental Center for Industrial Research" *(Bologna, Italy)*

Advisors: Prof. Elena Toth, Prof. Stefano Mattoccia

Research Topic: Developed and evaluated a novel optical flow scheme for camera-based surface flow velocity estimation. Compared performance to traditional techniques and evaluated sensitivity to various factors. Investigated potential for real-time gauge-cam implementations.

Objectives:
- Develop and implement the OTV algorithm
- Compare performance to traditional techniques
- Evaluate sensitivity to various factors
- Investigate potential for real-time gauge-cam implementations

Methodology: Implementation, data acquisition and analysis, performance comparison, sensitivity evaluation, feasibility exploration.

Papers and Code: In this project, a total of 3 papers were published at Remote Sensing and Applied Sciences jounals. The associated code for these papers is available at the following link:

- https://github.com/fabiotosi92/Optical-Tracking-Velocimetry

Note: The contract was interrupted before its natural conclusion as incompatible with the Ph.D. grant.

2013 – 2014   **Research Internship** @ University of Bologna *(Bologna, Italy)*
Topic: "Stereo Vision: Algorithms and Applications"
Supervisor: Prof. Stefano Mattoccia

Teaching Activities

Educator delivering computer science and engineering instruction across undergraduate, graduate, and doctoral levels. Curriculum development and delivery focuses on advanced topics including GPU architectures, CUDA programming, computer vision, and fundamental computer science principles, reaching diverse student audiences from beginners to specialized researchers.

Courses

Student Evaluation System: At Italian universities, teaching quality is measured through anonymous standardized surveys. Results presented as (A, B, C, D, E) indicate:
A: Overall course satisfaction percentage
B: Instructor accessibility percentage
C: Clarity of instruction percentage
D: Stimulation of subject interest percentage
E: Number of respondents
All percentages reflect combined "positive" and "very positive" ratings on a four-point scale.

2024/25   **Junior Assistant Professor**, *"Digital Systems M"* (Module 2 - GPU Architectures and CUDA C Programming) @ Department of Computer Science and Engineering (DISI), University of Bologna (Bologna, Italy) – Master's Degree (LM) in Computer Engineering (https://www.unibo.it/en/study/phd-professional-masters-specialisation-schools-and-other-programmes/course-unit-catalogue/course-unit/2024/468006) ∼ 70 students, *Student evaluations: (89.5%, 100%, 100%, 94.9%, 39)*

2023/24   **Junior Assistant Professor**, *"Fundamentals of Computer Science"* (Module 2) @ Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" (Bologna) (https://www.unibo.it/it/didattica/insegnamenti/insegnamento/2022/472922) ∼ 20 students, *Student evaluations: (85.7%, 100%, 100%, 85.7%, 7)*

2022/23   **Junior Assistant Professor**, *"Fundamentals of Computer Science"* (Module 2) @ Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" (Bologna) (https://www.unibo.it/it/didattica/insegnamenti/insegnamento/2022/472922) ∼ 15 students, *Student evaluations: (75.0%, 100%, 87.5%, 100%, 8)*

2021/22   **Adjunct Professor**, *"Fundamentals of Computer Science"* (Module 2) @ Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" (Bologna) (https://www.unibo.it/it/didattica/insegnamenti/insegnamento/2022/472922) ∼ 15 students, *Student evaluations: (100%, 100%, 100%, 100%, 4)*

PhD Teaching

2026 (Scheduled)   **PhD Course Teacher**, *"GPU-Accelerated Computing for AI and Computer Vision"*, PhD course in Computer Science and Engineering (DISI), University of Bologna (Bologna, Italy), 14 hours.

2026 (Scheduled)   **PhD Course Teacher**, *"CUDA Programming for High-Performance Computing"*, PhD course in Engineering and Information Technology for Structural and Environmental Monitoring and Risk Management – EIT4SEMM, University of Bologna (Bologna, Italy), 14 hours.

2023   **PhD Course Teacher**, *"Deep Scene Understanding from Images for Monitoring Applications"*, PhD course in Engineering and Information Technology for Structural and Environmental Monitoring and Risk Management – EIT4SEMM, University of Bologna (Bologna, Italy) with Dr. Matteo Poggi and Dr. Pierluigi Zama Ramirez, July 2023, 20 hours (https://cvlab-unibo.github.io/deep_scene_understanding_from_images_for_monitoring_applications/) ∼ 40 students.

2022   **PhD Course Teacher**, *"Deep Scene Understanding From Images"*, PhD course in Computer Science and Engineering, University of Bologna (Bologna, Italy) with Dr. Matteo Poggi and Dr. Pierluigi Zama Ramirez, May 2022, 20 hours (https://cvlab-unibo.github.io/deep_scene_understanding_from_images/) ∼ 40 students.

Masters

2019   **2nd Level Master Course**, *"Depth sensing technologies for autonomous vehicles"*, Master in Sustainable and Integrated Mobility In Urban Regions, University of Bologna, Imola (Bologna) ∼ 20 students.

Teaching Assistance

2019 – 2020   **Teaching Assistant**, "Computer architectures T - Computer Science and Engineering", @ University of Bologna *(Bologna, Italy)* with Prof. Stefano Mattoccia, ∼ 150 students

2017 – 2018   **Teaching Assistant**, "Logic Design T - Computer Science and Engineering", @ University of Bologna *(Bologna, Italy)* with Prof. Stefano Mattoccia and Prof. Alfredo D'Elia, ∼ 150 students.

Grants

Successfully secured funding to advance research in depth estimation technologies, with grants supporting both intellectual property development and commercialization of research outcomes.

Grants

[G1] **Proof of Concept d'Ateneo**, PoC UNIBO 3rd edition (38.900 €)

I was selected as the Principal Investigator (PI) for a project entitled "*Depth determination method based on images, self-adaptive neural networks, and relative system*". It was accepted among the first 7 funded by the University's Proof of Concept (POC) program, which seeks to promote the commercial viability of technologies developed in university research laboratories and facilitate their progression through the development, technical validation, and commercial validation stages. I was awarded a grant of 38,900 Euros to support the further development and validation of this innovative technology, which has the potential to address a significant challenge in the field of assisted and autonomous driving systems.

[G2] **Intellectual Property Award**, IPA 2021 (10.000 €)

At the Intellectual Property Award (IPA) event held at the Dubai Expo, our technology named "Method for determining the confidence of a disparity map through a self-adaptive learning of a neural network, and sensor system thereof" was recognized by the commission for its potential to address a significant challenge in the field of assisted and autonomous driving systems - namely, the accuracy of machine learning algorithms. Additionally, the proposed solution has the potential to be applied to a wider range of uses in the field of artificial vision systems, such as object recognition and tracking in dynamic environments. The IPA was organized by the Ministry of Economic Development and featured ideas from universities and public entities across Italy, including the University of Bologna. It was held in seven technological areas, including Agritech and Agrifood, Cybersecurity, Artificial Intelligence and Big Data, and Future mobility.

Acknowledgements & Awards

Recognized for valuable research and service contributions to the computer vision community, with multiple best paper/poster awards, thesis recognition, and consistent acknowledgment as Outstanding Reviewer for the field's most prestigious conferences.

Research

[R1] **Best Poster Award** to our work *"Self-Evolving Depth-Supervised 3D Gaussian Splatting from Rendered Stereo Pairs"* - British Machine Vision Conference (**BMVC 2024, A GRIN Rank**)

[R2] **Best PhD Thesis Award**, Italian Association for Computer Vision, Pattern Recognition and Machine Learning (**CVPL 2022**) (https://www.cvpl.it/en/awards/#miglior_tesi_dottorato).
National recognition for the thesis "Deep-learning for 3D reconstruction", selected as the most outstanding doctoral dissertation in computer vision in Italy among candidates who defended within a two-year eligibility period.

[R3] **Category Winner**, Intellectual Property Award for Future Mobility (**IPA 2021**) for our invention *"Self-confident: online learning for detecting depth sensor failures"* (https://uibm.mise.gov.it/images/DOSSIER.pdf)

[R4] **Best Paper Honorable Mention** to our work *"Neural Disparity Refinement for Arbitrary Resolution Stereo"* - International Conference on 3D Vision (**3DV 2021**) (https://3dv2021.surrey.ac.uk/prizes/)

Reviewer

Recognized as Outstanding Reviewer for top-tier computer vision conferences, a distinction awarded to a highly selective percentage of reviewers (typically between 2-8%) based on review quality and contribution as evaluated by Area Chairs. For CVPR 2024, this recognition was limited to the top 2% of 9,872 reviewers, while ECCV 2020 recognized 215 out of 2,830 reviewers (7.6%).

[OR1] **Outstanding** - Computer Vision and Pattern Recognition (**CVPR 2025**, A++ GRIN Rank) (https://cvpr.thecvf.com/Conferences/2025/ProgramCommittee)

[OR2] **Outstanding** - European Conference on Computer Vision (**ECCV 2024**, A++ GRIN Rank) (https://eccv.ecva.net/Conferences/2024/Reviewers#all-outstanding-reviewers)

[OR3] **Outstanding** - Computer Vision and Pattern Recognition (**CVPR 2024**, A++ GRIN Rank) (https://cvpr2023.thecvf.com/Conferences/2024/OutstandingReviewers)

[OR4] **Outstanding** - Computer Vision and Pattern Recognition (**CVPR 2023**, A++ GRIN Rank) (https://cvpr2023.thecvf.com/Conferences/2023/OutstandingReviewers)

[OR5] **Outstanding** - International Conference on Computer Vision (**ICCV 2021**, A++ GRIN Rank) (https://iccv2021.thecvf.com/outstanding-reviewers)

[OR6] **Outstanding** - European Conference on Computer Vision (**ECCV 2020**, A++ GRIN Rank) (https://eccv2020.eu/outstanding-reviewers/)

[ER1] **Emergency** - International Conference on Computer Vision (**ICCV 2023**), International Conference on 3D Vision (**3DV 2024**), Computer Vision and Pattern Recognition (**CVPR 2024, CVPR 2025**)

[ER2] **Emergency** - TradiCV Workshop (in conjunction with **ICCV 2021**) (https://sites.google.com/view/tradicv/committee)

Skills & Background Knowledge

Languages	Italian, *Mothertongue*
	English, *B2 certificate*
Programming languages	C, C++, C#, CUDA C, Java, Python, Lua, Scala, Prolog, VHDL, LateX
CV and ML frameworks	OpenCV, Tensorflow, PyTorch, Keras, NumPy, SciPy, Matplotlib, scikit-learn
CUDA Development	CUDA Programming, cuDNN, Thrust, CUDA Profiling Tools (Nsight Systems, Nsight Compute, Visual Profiler), Multi-GPU Programming
Development Tools	VS, VS Code, Git, Docker, CMake, Jupyter, Colab
OS & Platforms	Linux, Windows, Embedded Systems (ARM, NVIDIA Jetson), Edge Computing

Organization of Workshops & Tutorials

Active contributor to the international computer vision research community through organization of workshops and tutorials at top-tier venues. Established recurring workshops on critical technical challenges in SLAM, stereo and monocular depth estimation, with particular focus on complex scenes involving transparent and reflective surfaces. These initiatives have attracted participation from leading academic and industrial research teams.

Workshops

[W10] *"NeuSLAM 2024: 2nd Dense Neural SLAM Workshop"*, **ICCV 2025** (Honolulu, Huwaii) (accepted) [https://sites.google.com/view/neuslam] - **Role:** Organizer

[W9] *"TRICKY 2024: Transparent & Reflective objects In the Wild Challenges"*, **ICCV 2025** (accepted) (Honolulu, Huwaii) - **Role:** Organizer

[W8] *"NTIRE 2025: 10th New Trends in Image Restoration and Enhancement Workshop and Challenges"*, **CVPR 2025** (accepted) (Nashville, US) [https://cvlai.net/ntire/2025/] - **Role:** Organizer

[W7] *"MDEC - (4th) Monocular Depth Estimation Challenge"*, **CVPR 2025** (accepted) (Nashville, TN United States) [https://jspenmar.github.io/MDEC/] - **Role:** Organizer

[W6] *"NeuSLAM 2024: 1st Dense Neural SLAM Workshop"*, **ECCV 2024** (Milano, IT) [https://sites.google.com/view/neuslam] - **Role:** Organizer

[W5] *"TradiCV 2024: 2nd Workshop on Traditional Computer Vision in the Age of Deep Learning (TradiCV)"*, **ECCV 2024** (Milano, IT) [https://sites.google.com/view/tradicv] - **Role:** Organizer

[W4] *"TRICKY 2024: Transparent & Reflective objects In the Wild Challenges"*, **ECCV 2024** (Milano, IT) [https://sites.google.com/view/eccv24-tricky-workshop/] - **Role:** Organizer

[W3] *"NTIRE 2024: 9th New Trends in Image Restoration and Enhancement Workshop and Challenges"*, **CVPR 2024** (Seattle, US) [https://cvlab-unibo.github.io/booster-web/ntire][https://cvlai.net/ntire/2024/] - **Role:** Organizer

Track 1 - HR Depth from Images of Specular and Transparent Surfaces - Stereo [https://codalab.lisn.upsaclay.fr/competitions/17515]

Track 2 - HR Depth from Images of Specular and Transparent Surfaces - Mono [https://codalab.lisn.upsaclay.fr/competitions/17516]

[W2] *"MDEC - (3rd) Monocular Depth Estimation Challenge"*, **CVPR 2024** (Seattle, WA, United States) [https://jspenmar.github.io/MDEC/] - **Role:** Organizer

[W1] *"NTIRE 2023: 8th New Trends in Image Restoration and Enhancement Workshop and Challenges"*, **CVPR 2023** (Vancouver, Washington) [https://cvlab-unibo.github.io/booster-web/ntire][https://cvlai.net/ntire/2023/] - **Role:** Organizer

Track 1 - HR Depth from Images of Specular and Transparent Surfaces - Stereo [https://codalab.lisn.upsaclay.fr/competitions/10494]

Track 2 - HR Depth from Images of Specular and Transparent Surfaces - Mono [https://codalab.lisn.upsaclay.fr/competitions/10502]

Tutorials

Delivered 5 technical tutorials at major international computer vision conferences, providing in-depth educational content on depth estimation technologies to researchers and practitioners from around the world.

[T5] M. Poggi, **F. Tosi**, *"Deep Stereo Matching in the Twenties"*, **CVPR 2024** (Seattle, Washington, US) [https://sites.google.com/view/stereo-twenties] - **Role:** Organizer

[T4] M. Poggi, **F. Tosi**, F. Aleotti, K. Batsos, P. Mordohai, S. Mattoccia, *"Facing depth estimation in-the-wild with deep networks"*, **ECCV 2020** (SEC, Glasgow) [https://sites.google.com/view/eccv-2020-robust-depth/home] - **Role:** Organizer

[T3] M. Poggi, **F. Tosi**, F. Aleotti, S. Mattoccia, C. Godard, J. Watson, M. Firman, G. J. Brostow, *"Learning and understanding single image depth estimation in the wild"*, **CVPR 2020** (Seattle, Washington, US) [https://sites.google.com/view/cvpr-2020-depth-from-mono/home] - **Role:** Organizer

[T2] M. Poggi, **F. Tosi**, K. Batsos, P. Mordohai, S. Mattoccia, *"Learning - based depth estimation from stereo and monocular images: successes, limitations and future challenges"*, **CVPR 2019** (Long Beach, California, US)[https://sites.google.com/view/cvpr-2019-depth-from-image/home] - **Role:** Organizer

[T1] M. Poggi, **F. Tosi**, K. Batsos, P. Mordohai, S. Mattoccia, *"Learning-based depth estimation from stereo and monocular images: successes, limitations and future challenges"*, **3DV 2018** (Verona, Italy) [https://sites.google.com/view/3dv-2018-depth-from-image/home] - **Role:** Organizer

Live Demonstrations

Developer and presenter of cutting-edge computer vision demonstrations at major international conferences, demonstrating practical applications of depth estimation research. These live demonstrations translate theoretical research into real-world implementations, featuring real-time depth perception systems that operate on various hardware platforms from high-performance GPUs to resource-constrained embedded devices.

Demos

[I9] L. Bartolomei, **F. Tosi**, M. Poggi, S. Mattoccia, *"Robust Zero-Shot Depth Perception through Mono-Stereo Fusion"*, **CVPR 2025** (accepted) (Nashville, US) [https://stereoanywhere.github.io/] - **Role:** Organizer

[I8] L. Bartolomei, M. Poggi, **F. Tosi**, A. Conti, S. Mattoccia, *"Multi-Setup Depth Perception through Virtual Image Hallucination"*, **ECCV 2024** (Milan, IT) [https://eventvppstereo.github.io/demo.html] - **Role:** Organizer

[I7] L. Bartolomei, M. Poggi, **F. Tosi**, A. Conti, S. Mattoccia, *"Robust depth perception through Virtual Pattern Projection"*, **CVPR 2024** (Seattle, US) [https://github.com/bartn8/cvpr24-demo/?tab=readme-ov-file] - **Role:** Organizer

[I6] M. Poggi, **F. Tosi**, S. Mattoccia, *Scene perception from images with deep-learning*, **EXPO 2020/22 Dubai**. Real-time 3D mapping and social distance monitoring using deep-learning techniques applied to monocular vision systems.

[I5] A. Tonioni, **F. Tosi**, M. Poggi, S. Mattoccia, L. Di Stefano, *"Real-Time self-adaptive deep stereo"*, **CVPR 2019** (Long Beach, California, US) - **Role:** Organizer

[I4] M. Poggi, **F. Tosi**, F. Aleotti, S. Mattoccia, *"Real-Time monocular depth estimation without GPU"*, **CVPR 2019** (Long Beach, California, US) - **Role:** Organizer

[I3] V. Peluso, A. Cipolletta, A. Calimera, M. Poggi, **F. Tosi**, S. Mattoccia, *"Energy - Efficient Monocular Depth Estimation on ARM - based Embedded Platforms"*, U-boot at **DATE 2019** (Firenze, Italy) - **Role:** Organizer

[I2] M. Poggi, **F. Tosi**, S. Mattoccia, *"Towards real-time monocular and unsupervised depth estimation on CPU"*, **3DV 2018** (Verona, Italy) - **Role:** Organizer

[I1] M. Poggi, **F. Tosi**, S. Mattoccia, *"Towards real-time learning of monocular depth estimation enabling multiple view synthesis on CPU"*, **ECCV 2018** (Munich, Germany) - **Role:** Organizer

Patents

Co-inventor on five patent applications in the field of computer vision, focusing on computational techniques for depth estimation from images, confidence assessment for disparity maps, and real-time processing systems. These patents represent technical solutions developed through research collaboration at the University of Bologna.

Patents

[B5] L. Bartolomei, M. Poggi, **F. Tosi**, S. Mattoccia, *"Apparato di elaborazione di immagini, corrispondente procedimento e prodotto informatico"*, pending (102023000014727, July 7, 2023)

[B4] M. Poggi, F. Aleotti, **F. Tosi**, S. Mattoccia, V. Peluso, A. Cipolletta, A. Calimera, *"Method for determining the depth from a single image and system thereof"*, pending (102021000007175, March 24, 2021)

[B3] M. Poggi, F. Aleotti, **F. Tosi**, S. Mattoccia, *"Method for determining the confidence of a disparity map through a self-adaptive learning of a neural network, and sensor system thereof"*, pending (102020000016054, July 2, 2020), **Intellectual Property Award**

[B2] A. Tonioni, **F. Tosi**, M. Poggi, S. Mattoccia, L. Di Stefano, *"Depth determination method based on images, self-adaptive neural networks, and relative system"* (Real-Time Self Adaptive Deep Stereo), pending (2019)

[B1] M. Poggi, D. Pallotti, **F. Tosi**, S. Mattoccia, *"Depth determination method based on images, and relative system"* (Guided Stereo Matching), - pending (102019000006964, March 23, 2021) - a research project funded by University of Bologna, PoC UNIBO 2nd edition

Full Publication List

All publications are peer-reviewed conference or journal publications and top tier in the respective field. **ICCV**, **ECCV** and **CVPR** are highly competitive with acceptance rates of less than 30%. **CVPR** and **TPAMI** are the most highly cited IEEE conference (https://research.com/conference-rankings/computer-science) and journal (https://research.com/journals-rankings/computer-science) with the highest impact in Engineering and Computer Science. **CVPR**, **ECCV** and **ICCV** are among the four most impactful conferences in all of computer science. †indicates *Joint first authorship.*

Citation Indices

Research impact metrics across major academic platforms, demonstrating significant influence in computer vision and deep learning communities.

Accessed: 09.05.2025

Proceedings

[P47] A. Obukhov, M. Poggi, **F. Tosi**, R. Singh Arora, J. Spencer, C. Russell, S. Hadfield, R. Bowden, et al., *"The Fourth Monocular Depth Estimation Challenge"*, IEEE Computer Society Conference on Computer Vision and Pattern Recognition Workshops (**CVPRW**), 2025

[P46] L. Bartolomei, **F. Tosi**, M. Poggi, S. Mattoccia, *"Stereo Anywhere: Robust Zero-Shot Deep Stereo Matching Even Where Either Stereo or Mono Fail "*, IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**, A++ GRIN Rank), Nashville, US, 2025

[P45] Z. Gong, **F. Tosi**, Y. Zhang, S. Mattoccia, M. Poggi, *"HS-SLAM: Hybrid Representation with Structural Supervision for Improved Dense SLAM"*, IEEE International Conference on Robotics and Automation (**ICRA**, A GRIN Rank), Georgia World Congress Center, Atlanta, Georgia, USA, May 19–23, 2025.

[P44] U. Cavalcanti, M. Poggi, **F. Tosi**, V. Cambareri, V. Zlokolica, S. Mattoccia, *"CabNIR: A Benchmark for In-Vehicle Infrared Monocular Depth Estimation"*, IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV**, A GRIN Rank)), Tucson, Arizona, US, Feb 28 – Mar 4, 2024

[P43] S. Safadoust, **F. Tosi**, F. Guney, M. Poggi, *"Self-Evolving Depth-Supervised 3D Gaussian Splatting from Rendered Stereo Pairs"*, 35th British Machine Vision Conference (**BMVC**, A GRIN Rank), Glasgow, UK, November 25-28, 2024 (**Best Poster Award**)

[P42] **F. Tosi**, P. Zama Ramirez, M. Poggi, *"Diffusion Models for Monocular Depth Estimation: Overcoming Challenging Conditions"*, European Conference on Computer Vision (**ECCV**, A++ GRIN Rank), Milan, Italy, 2024, pp. 236-257, https://dx.doi.org/10.1007/978-3-031-73337-6_14

[P41] P. Zama Ramirez, **F. Tosi**, L. Di Stefano, R. Timofte, A. Costanzino, M. Poggi, S. Salti, S. Mattoccia, et al., *"NTIRE 2024 Challenge on HR Depth from Images of Specular and Transparent Surfaces"*, IEEE Computer Society Conference on Computer Vision and Pattern Recognition Workshops (**CVPRW**), 2024, pp. 6499-6512, https://dx.doi.org/10.1109/CVPRW63382.2024.00650

[P40] J. Spencer, **F. Tosi**, M. Poggi, R. Singh Arora, C. Russell, S. Hadfield, R. Bowden, et al., *"The Third Monocular Depth Estimation Challenge"*, IEEE Computer Society Conference on Computer Vision and Pattern Recognition Workshops (**CVPRW**), 2024, pp. 1-14, https://dx.doi.org/10.1109/cvprw63382.2024.00005

[P39] M. Poggi, **F. Tosi**, *"Federated Online Adaptation for Deep Stereo"*, IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**, A++ GRIN Rank), Seattle, US, 2024, https://doi.org/10.1109/CVPR52733.2024.01906

[P38] L. Bartolomei, M. Poggi, A. Conti, **F. Tosi**, S. Mattoccia, *"Revisiting Depth Completion from a Stereo Matching Perspective for Cross-domain Generalization"*, 2024 International Conference on 3D Vision (**3DV**, A- GRIN Rank), Davos, Switzerland, 2024, pp. 1360-1370, https://doi.org/10.1109/3DV62453.2024.00127

[P37] Y. Zhang, **F. Tosi**, S. Mattoccia, M. Poggi, *"GO-SLAM: Global Optimization for Consistent 3D Instant Reconstruction"* 2023 IEEE/CVF International Conference on Computer Vision (**ICCV**, A++ GRIN Rank), Paris, France, 2023, pp. 3704-3714, , Paris, France, October 4-6, 2023, https://doi.org/10.1109/ICCV51070.2023.00345

[P36] L. Bartolomei, M. Poggi, **F. Tosi**, A. Conti, S. Mattoccia, *"Active Stereo Without Pattern Projector"* 2023 IEEE/CVF International Conference on Computer Vision (**ICCV**, A++ GRIN Rank), Paris, France, 2023, pp. 18424-18436, https://doi.org/10.1109/ICCV51070.2023.01693

[P35] C. Zhao, M. Poggi, **F. Tosi**, l. Zhou, Q. Sun, Y. Tang, S. Mattoccia, *"GasMono: Geometry-Aided Self-Supervised Monocular Depth Estimation for Indoor Scenes"* 2023 IEEE/CVF International Conference on Computer Vision (**ICCV**, A++ GRIN Rank), Paris, France, 2023, pp. 16163-16174, https://doi.org/10.1109/ICCV51070.2023.01485

[P34] A. Costanzino[†], P. Zama Ramirez[†], M. Poggi[†], **F. Tosi**, S. Mattoccia, L. Di Stefano, *"Learning Depth Estimation for Transparent and Mirror Surfaces"* 2023 IEEE/CVF International Conference on Computer Vision (**ICCV**, A++ GRIN Rank), Paris, France, 2023, pp. 9210-9221, 10.1109/ICCV51070.2023.00848

[P33] **F. Tosi**, A. Tonioni, D. De Gregorio, M. Poggi, *"NeRF-Supervised Deep Stereo"* 2023 IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**, A++ GRIN Rank), Vancouver, BC, Canada, 2023, pp. 855-866, https://doi.org/10.1109/CVPR52729.2023.00089

[P32] P. Zama Ramirez, **F. Tosi**, L. Di Stefano, R. Timofte, *"NTIRE 2023 Challenge on HR Depth from Images of Specular and Transparent Surfaces"*, 2023 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (**CVPRW**), Vancouver, BC, Canada, 2023, pp. 1384-1395, https://10.1109/CVPRW59228.2023.00143

[P31] R. Fan, **F. Tosi**, M. Poggi, S. Mattoccia, *"Lightweight Self-Supervised Depth Estimation with few-beams LiDAR Data"*, 34th British Machine Vision Conference (**BMVC**, A GRIN Rank), Aberdeen, UK, November 20-24, 2023

[P30] H. Li, M. Poggi, **F. Tosi**, S. Mattoccia, *"On-Site Adaptation for Monocular Depth Estimation with a Static Camera"*, 34th British Machine Vision Conference (**BMVC**, A GRIN Rank), Aberdeen, UK, November 20-24, 2023 (**ORAL**)

[P29] J. Spencer, C. Stella Qian, M. Trescakova, C. Russell, S. Hadfield, E. W. Graf, W. J. Adams, A. J. Schofield, J. Elder, R. Bowden, A. Anwar, H. Chen, X. Chen, K. Cheng, Y. Dai, H. T. Hoa, S. Hossain, J. Huang, M. Jing, B. Li, C. Li, B. Li, Z. Liu, S. Mattoccia, S. Mercelis, M. Nam, M. Poggi, X. Qi, J. Ren, Y. Tang, **F. Tosi**, L. Trinh, S. M. N. Uddin, K. M. Umair, K. Wang, Y. Wang, Y. Wang, M. Xiang, G. Xu, W. Yin, J. Yu, Q. Zhang, C. Zhao, *"The Second Monocular Depth Estimation Challenge"*, 2023 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (**CVPRW**), Vancouver, BC, Canada, 2023, pp. 3064-3076, https://10.1109/CVPRW59228.2023.00308.

[P28] J. Spencer, C. S. Qian, C. Russell, S. Hadfield, E. Graf, W. Adams, A. J. Schofield, J. Elder, R. Bowden, H. Cong, S. Mattoccia, M. Poggi, Z. K. Suri, Y. Tang, **F. Tosi**, H. Wang, Y. Zhang, Y. Zhang, C. Zhao, "*The Monocular Depth Estimation Challenge*", at IEEE Winter Conference on Applications of Computer Vision Workshops (**WACVW 2023**), DOIR:10.1109/WACVW58289.2023.00069

[P27] **F. Tosi**[†], P. Zama Ramirez[†], M. Poggi[†], S. Salti, L. Di Stefano, S. Mattoccia, *"RGB-Multispectral Matching: Dataset, Learning Methodology, Evaluation"* 2022 IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**, A++ GRIN Rank), 2022, pp. 15937-15947, https://doi.org/10.1109/CVPR52688.2022.01549.

[P26] P. Zama Ramirez[†], **F. Tosi**[†], M. Poggi[†], S. Salti, L. Di Stefano, S. Mattoccia, *"Open Challenges in Deep Stereo: the Booster Dataset"*, 2022 IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**, A++ GRIN Rank), 2022, pp. 21136-21146, https://doi.org/10.1109/CVPR52688.2022.02049.

[P25] M. Poggi[†], P. Zama Ramirez[†], **F. Tosi**[†], S. Salti, L. Di Stefano, S. Mattoccia, *"Cross-Spectral Neural Radiance Fields"*, at the International Conference on 3D Vision (**3DV**), Prague, Czech Republic, 2022, pp. 668-678, https://doi.org/10.1109/3DV57658.2022.00071

[P24] Chaoqiang Zhao, Youmin Zhang, M. Poggi, **F. Tosi**, Xianda Guo, Zheng Zhu, Guan Huang, Yang Tang, S. Mattoccia, *"MonoViT: Self-Supervised Monocular Depth Estimation with a Vision Transformer"*, at the International Conference on 3D Vision (**3DV**), Prague, Czech Republic, 2022, pp. 668-678, https://doi.org/10.1109/3DV57658.2022.00077

[P23] F. Aleotti[†], **F. Tosi**[†], P. Zama Ramirez[†], M. Poggi, S. Salti, L. Di Stefano, S. Mattoccia, *"Neural Disparity Refinement for Arbitrary Resolution Stereo"*, 2021 International Conference on 3D Vision (**3DV**), 2021, pp. 207-217, https://doi.org/10.1109/3DV53792.2021.00031. (**ORAL**) (**Best Paper Honarable Mention Award**)

[P22] **F. Tosi**, Y. Liao, C. Schmitt, A. Geiger, "SMD-Nets: Stereo Mixture Density Networks", 2021 IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**, A++ GRIN Rank), 2021, pp. 8938-8948, https://doi.org/10.1109/CVPR46437.2021.00883 - featured in the BEST OF CVPR of Computer Vision News.

[P21] F. Aleotti[†], **F. Tosi**[†], L. Zhang, M. Poggi, S. Mattoccia, "Reversing the cycle: self-supervised deep stereo through enhanced monocular distillation", In: Vedaldi, A., Bischof, H., Brox, T., Frahm, JM. (eds) Computer Vision – (**ECCV**, A++ GRIN Rank), 2020. Lecture Notes in Computer Science(), vol 12356. Springer, Cham. https://doi.org/10.1007/978-3-030-58621-8_36

[P20] M. Poggi, F. Aleotti, **F. Tosi**, G. Zaccaroni, S. Mattoccia, "Self-adapting confidence estimation for stereo", . In: Vedaldi, A., Bischof, H., Brox, T., Frahm, JM. (eds) Computer Vision – (**ECCV**, A++ GRIN Rank), 2020. Lecture Notes in Computer Science(), vol 12369. Springer, Cham. https://doi.org/10.1007/978-3-030-58586-0_42.)

[P19] **F. Tosi**[†], F. Aleotti[†], P. Zama Ramirez[†], M. Poggi, S. Salti, L. Di Stefano, S. Mattoccia, *"Distilled Semantics for Comprehensive Scene Understanding from Videos"*, 2020 IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**, A++ GRIN Rank), 2020, pp. 4653-4664, https://doi.org/10.1109/CVPR42600.2020.00471.

[P18] M. Poggi, F. Aleotti, **F. Tosi**, S. Mattoccia, *"On the uncertainty of self-supervised monocular depth estimation"*, 2020 IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**, A++ GRIN Rank), 2020, pp. 3224-3234, https://doi.org/10.1109/CVPR42600.2020.00329.

[P17] M. Poggi, **F. Tosi**, F. Aleotti, S. Mattoccia, *"Leveraging a weakly adversarial paradigm for joint learning of disparity and confidence estimation"*, 2020 25th International Conference on Pattern Recognition (**ICPR**, A- GRIN Rank), 2021, pp. 270-277, https://doi.org/10.1109/ICPR48806.2021.9412594.

[P16] V. Peluso, A. Cipolletta, A. Calimera, M. Poggi, **F. Tosi**, F. Aleotti, S. Mattoccia, "*Enabling monocular depth perception at the very edge*", 2020 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (**CVPRW**), 2020, pp. 1581-1583, https://doi.org/10.1109/CVPRW50498.2020.00204.

[P15] F. Aleotti, M. Poggi, **F. Tosi**, S. Mattoccia, *"Learning end-to-end scene flow by distilling single tasks knowledge"*, Proceedings of the **AAAI** (A++ GRIN Rank) - Conference on Artificial Intelligence, 34(07), 10435-10442. https://doi.org/10.1609/aaai.v34i07.6613.

[P14] M. Poggi[†], D. Pallotti[†], **F. Tosi** and S. Mattoccia, *"Guided Stereo Matching"*, 2019 IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**, A++ GRIN Rank), 2019, pp. 979-988, https://doi.org/10.1109/CVPR.2019.00107.

[P13] **F. Tosi**, F. Aleotti, M. Poggi and S. Mattoccia, *"Learning monocular depth estimation infusing traditional stereo knowledge"*, 2019 IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**, A++ GRIN Rank), 2019, pp. 9791-9801, https://doi.org/10.1109/CVPR.2019.01003.

[P12] A. Tonioni, **F. Tosi**, M. Poggi, S. Mattoccia and L. Di Stefano, *"Real-time self-adaptive deep stereo"*, 2019 IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**, A++ GRIN Rank), 2019, pp. 195-204, https://doi.org/10.1109/CVPR.2019.00028. (**ORAL**)

[P11] **F. Tosi**, M. Poggi, S. Mattoccia, *"Leveraging confident points for accurate depth refinement on embedded systems"*, 2019 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (**CVPRW**), 2019, pp. 158-167, https://doi.org/10.1109/CVPRW.2019.00025.

[P10] V. Peluso, A. Cipolletta, A. Calimera, M. Poggi, **F. Tosi** and S. Mattoccia, *"Enabling Energy-Efficient Unsupervised Monocular Depth Estimation on ARMv7-Based Platforms"*, 2019 Design, Automation & Test in Europe Conference & Exhibition (**DATE**, A GRIN Rank), 2019, pp. 1703-1708, https://doi.org/10.23919/DATE.2019.8714893.

[P9] M. Poggi, **F. Tosi**, S. Mattoccia, *"Learning monocular depth estimation with unsupervised trinocular assumptions"*, 2018 International Conference on 3D Vision (**3DV**), 2018, pp. 324-333, https://doi.org/10.1109/3DV.2018.00045.

[P8] P. Zama Ramirez, M. Poggi, **F. Tosi**, S. Mattoccia, L. Di Stefano, *"Geometry meets semantic for semi-supervised monocular depth estimation"*, In: Jawahar, C., Li, H., Mori, G., Schindler, K. (eds) Computer Vision – (**ACCV**, B GRIN Rank), 2018. Lecture Notes in Computer Science(), vol 11363. Springer, Cham. https://doi.org/10.1007/978-3-030-20893-6_19

[P7] **F. Tosi**, M. Poggi, A. Benincasa, S. Mattoccia, *"Beyond local reasoning for stereo confidence estimation with deep learning"*, In: Ferrari, V., Hebert, M., Sminchisescu, C., Weiss, Y. (eds) Computer Vision – **ECCV**, A++ GRIN Rank. ECCV 2018. Lecture Notes in Computer Science(), vol 11210. Springer, Cham. https://doi.org/10.1007/978-3-030-01231-1_20

[P6] M. Poggi, F. Aleotti, **F. Tosi**, S. Mattoccia, *"Towards real-time unsupervised monocular depth estimation on CPU"*, 2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**, A+ GRIN Rank), 2018, pp. 5848-5854, https://doi.org/10.1109/IROS.2018.8593814.

[P5] F. Aleotti, **F. Tosi**, M. Poggi, S. Mattoccia, *"Generative Adversarial Networks for unsupervised monocular depth prediction"*, In: Leal-Taixé, L., Roth, S. (eds) Computer Vision – **ECCV 2018 Workshops**. ECCV 2018. Lecture Notes in Computer Science(), vol 11129. Springer, Cham. https://doi.org/10.1007/978-3-030-11009-3_20

[P4] M. Poggi, **F. Tosi**, S. Mattoccia, *"Quantitative evaluation of confidence measures in a machine learning world"*, 2017 IEEE International Conference on Computer Vision (**ICCV**, A++ GRIN Rank), 2017, pp. 5238-5247, https://doi.org/10.1109/ICCV.2017.559 (**SPOTLIGHT**)

[P3] **F. Tosi**, M. Poggi, A.Tonioni, L. Di Stefano, S. Mattoccia, *"Learning confidence measures in the wild"*, In T.K. Kim, S. Zafeiriou, G. Brostow and K. Mikolajczyk, editors, Proceedings of the British Machine Vision Conference (**BMVC**, A GRIN Rank), pages 133.1-133.13. BMVA Press, September 2017, https://doi.org/10.5244/C.31.133

[P2] M. Poggi, **F. Tosi**, S. Mattoccia, *"Efficient confidence measures for embedded stereo"*, In: Battiato, S., Gallo, G., Schettini, R., Stanco, F. (eds) Image Analysis and Processing - (**ICIAP**, B GRIN Rank), 2017. Lecture Notes in Computer Science(), vol 10484. Springer, Cham. https://doi.org/10.1007/978-3-319-68560-1_43

[P1] M. Poggi, **F. Tosi**, S. Mattoccia, *"Even More Confident predictions with deep machine-learning"*, 2017 IEEE Conference on Computer Vision and Pattern Recognition Workshops (**CVPRW**), 2017, pp. 393-401, https://doi.org/10.1109/CVPRW.2017.54.

Journals

[J18] **F. Tosi**, L. Bartolomei, M. Poggi, *"A Survey on Deep Stereo Matching in the Twenties"*, International Journal of Computer Vision (IJCV), Springer, 2025. [Journal: Q1, IF: 11.6, H-Index: 221] DOI: 10.1007/s11263-024-02331-0.

[J17] X. Qiao, C. Ge, Y. Zhang, Y. Zhou, **F. Tosi**, M. Poggi, S. Mattoccia, *"Depth Super-Resolution from Explicit and Implicit High-Frequency Features"*, Computer Vision and Image Understanding (CVIU), 2023, [Journal: Q1, IF: 4.3, CiteScore: 7.8] https://doi.org/10.1016/j.cviu.2023.103841.

[J16] X. Qiao, C. Ge, C. Zhao, **F. Tosi**, M. Poggi, S. Mattoccia, *"Self-supervised Depth Super-resolution with Contrastive Multiview Pre-training"*, Neural Networks (NN), 2023, [Journal: Q1, IF: 6.0, CiteScore: 13.9] https://doi.org/10.1016/j.neunet.2023.09.023.

[J15] **F. Tosi**, F. Aleotti, P. Zama Ramirez, M. Poggi, S. Mattoccia and L. D. Stefano, *"Neural Disparity Refinement"* in IEEE Transactions on Pattern Analysis and Machine Intelligence, 2024, [Journal: Q1, IF: 20.8, CiteScore: 28.4, H-Index: 417] https://doi.org/10.1109/TPAMI.2024.3411292.

[J14] P. Zama Ramirez, A. Costanzino, **F. Tosi**, M. Poggi, S. Mattoccia and L. D. Stefano, *"Booster: a Benchmark for Depth from Images of Specular and Transparent Surfaces"* in IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 46, no. 1, pp. 85-102, Jan. 2024, [Q1, IF: 20.8, CiteScore: 28.4] https://doi:10.1109/TPAMI.2023.3323858.

[J13] M. Poggi, **F. Tosi**, F. Aleotti and S. Mattoccia, *"Real-Time Self-Supervised Monocular Depth Estimation Without GPU"* in IEEE Transactions on Intelligent Transportation Systems, vol. 23, no. 10, pp. 17342-17353, Oct. 2022, [Q1, IF: 7.9, CiteScore: 14.8] https://doi.org/10.1109/TITS.2022.3157265.

[J12] M. Poggi, A. Tonioni, **F. Tosi**, S. Mattoccia and L. D. Stefano, *"Continual Adaptation for Deep Stereo"* in IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 44, no. 9, pp. 4713-4729, 1 Sept. 2022, [Q1, IF: 20.8, CiteScore: 28.4] https://doi.org/10.1109/TPAMI.2021.3075815.

[J11] M. Poggi, **F. Tosi**, K. Batsos, P. Mordohai and S. Mattoccia, *"On the Synergies Between Machine Learning and Binocular Stereo for Depth Estimation From Images: A Survey"* in IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 44, no. 9, pp. 5314-5334, 1 Sept. 2022, [Q1, IF: 20.8, CiteScore: 28.4] https://doi.org/10.1109/TPAMI.2021.3070917.

[J10] M. Poggi, S. Kim, **F. Tosi**, S. Kim, F. Aleotti, D. Min, K. Sohn, and S. Mattoccia, *"On the Confidence of Stereo Matching in a Deep-Learning Era: A Quantitative Evaluation"* in IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 44, no. 9, pp. 5293-5313, 1 Sept. 2022, [Q1, IF: 20.8, CiteScore: 28.4] https://doi.org/10.1109/TPAMI.2021.3069706.

 [J9] A. Cipolletta, V. Peluso, A. Calimera, M. Poggi, **F. Tosi**, F. Aleotti, S. Mattoccia, *"Energy-Quality Scalable Monocular Depth Estimation on Low-Power CPUs"* in IEEE Internet of Things Journal, vol. 9, no. 1, pp. 25-36, 1 Jan.1, 2022, [Q1, IF: 8.2, CiteScore: 17.6] https://doi.org/10.1109/JIOT.2021.3080827.

 [J8] V. Peluso, A. Cipolletta, A. Calimera, M. Poggi, **F. Tosi**, F. Aleotti, S. Mattoccia, *"Monocular Depth Perception on Microcontrollers for Edge Applications"* in IEEE Transactions on Circuits and Systems for Video Technology, vol. 32, no. 3, pp. 1524-1536, March 2022, [Q1] https://doi.org/10.1109/TCSVT.2021.3077395.

 [J7] A. Livoroi, A. Conti, L. Foianesi, **F. Tosi**, F. Aleotti, M. Poggi, F. Tauro, E. Toth, S. Grimaldi, S. Mattoccia, *"On the Deployment of Out-of-the-Box Embedded Devices for Self-Powered River Surface Flow Velocity Monitoring at the Edge"* Applied Sciences 11, no. 15: 7027. https://doi.org/10.3390/app11157027.

 [J6] F. Aleotti, G. Zaccaroni, L. Bartolomei, M. Poggi, **F. Tosi**, S. Mattoccia, *"Real-time single image depth perception in the wild with handheld devices"*, MDPI Sensors, [Q1/Q2, IF: 3.4, CiteScore: 7.3] https://doi.org/10.3390/s21010015.

 [J5] M. Poggi, **F. Tosi**, S. Mattoccia, *"Learning a confidence measure in the disparity domain from O(1) features"*, Computer Vision and Image Understanding (CVIU), [Q1, IF: 4.3, CiteScore: 7.8] https://doi.org/10.1016/j.cviu.2020.102905.

 [J4] M. Poggi, G. Agresti, **F. Tosi**, P. Zanuttigh, S. Mattoccia, *"Confidence Estimation for ToF and Stereo Sensors and Its Application to Depth Data Fusion"* in IEEE Sensors Journal, vol. 20, no. 3, pp. 1411-1421, 1 Feb.1, 2020, [Q1, IF: 4.3, CiteScore: 7.7] https://doi.org/10.1109/JSEN.2019.2946591.

 [J3] M. Poggi, **F. Tosi**, S. Mattoccia, *"Good Cues to Learn From Scratch a Confidence Measure for Passive Depth Sensors"* in IEEE Sensors Journal, vol. 20, no. 22, pp. 13533-13541, 15 Nov.15, 2020, [Q1, IF: 4.3, CiteScore: 7.7] https://doi.org/10.1109/JSEN.2020.3004629.

 [J2] **F. Tosi**, M. Rocca, F. Aleotti, M. Poggi, S. Mattoccia, F. Tauro, E. Toth, S. Grimaldi, *"Enabling Image-Based Streamflow Monitoring at the Edge"* Remote Sensing 12, no. 12: 2047. [Q1, IF: 4.2, CiteScore: 8.3] https://doi.org/10.3390/rs12122047.

 [J1] F. Tauro, **F. Tosi**, S. Mattoccia, E. Toth, R. Piscopia, S. Grimaldi, *"Optical Tracking Velocimetry (OTV): Leveraging Optical Flow and Trajectory-Based Filtering for Surface Streamflow Observations"* Remote Sensing 10, no. 12: 2010. [Q1, IF: 4.2, CiteScore: 8.3] https://doi.org/10.3390/rs10122010.

Pre-Prints

[PP2] L. Bartolomei, M. Poggi, **F. Tosi**, A. Conti, S. Mattoccia *"Stereo-Depth Fusion through Virtual Pattern Projection"*, arXiv (pre-print) 2024, (https://arxiv.org/pdf/2406.04345).

[PP1]	**F. Tosi**, Y. Zhang, Z. Gong, E. Sandström, S. Mattoccia, M. R. Oswald, M. Poggi, *"How NeRFs and 3D Gaussian Splatting are Reshaping SLAM: a Survey"*, arXiv (pre-print) 2024, (https://arxiv.org/pdf/2402.13255.pdf).
Other Pubblications	S. Mattoccia, M. Poggi, **F. Tosi**, F. Aleotti, *"Deep learning e Computer vision: le tecnologie abilitanti del 3D"*, Sistemi&Impresa, ESTE - Edizioni Scientifiche Tecniche Europee Srl, pag 62-65, Febbraio 2020.

Talks in International Conferences

[T18] **Diffusion Models for Monocular Depth Estimation: Overcoming Challenging Conditions**
European Conference on Computer Vision, Milan, Italy (ECCV 2024)

[T17] **NeRF-Supervised Deep Stereo**
IEEE/CVF Conference on Computer Vision and Pattern Recognition, Vancouver, BC, Canada, (CVPR 2023)

[T16] **Open Challenges in Deep Stereo: the Booster Dataset**
IEEE/CVF Conference on Computer Vision and Pattern Recognition, New Orleans, LA, USA (CVPR 2022)

[T15] **Neural Disparity Refinement for Arbitrary Resolution Stereo**
International Conference on 3D Vision, (3DV 2021)

[T14] **SMD-Nets: Stereo Mixture Density Networks**
IEEE/CVF Conference on Computer Vision and Pattern Recognition, (CVPR 2021)

[T14] **Reversing the cycle: self-supervised deep stereo through enhanced monocular distillation**
European Conference on Computer Vision, (ECCV 2020)

[T13] **Self-adapting confidence estimation for stereo**
European Conference on Computer Vision, Munich, Germany (ECCV 2020)

[T12] **Distilled Semantics for Comprehensive Scene Understanding from Videos**
IEEE/CVF Conference on Computer Vision and Pattern Recognition, (CVPR 2020)

[T11] **On the uncertainty of self-supervised monocular depth estimation**
IEEE/CVF Conference on Computer Vision and Pattern Recognition, (CVPR 2020)

[T10] **Guided Stereo Matching**
IEEE/CVF Conference on Computer Vision and Pattern Recognition, Long Beach, CA, USA (CVPR 2019)

[T9] **Learning monocular depth estimation infusing traditional stereo knowledge**
IEEE/CVF Conference on Computer Vision and Pattern Recognition, Long Beach, CA, USA (CVPR 2019)

[T8] **Real-time self-adaptive deep stereo**
IEEE/CVF Conference on Computer Vision and Pattern Recognition, Long Beach, CA, USA (CVPR 2019)

[T7] **Leveraging confident points for accurate depth refinement on embedded systems**
IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops, Long Beach, CA, USA (CVPRW 2019)

[T6] **Enabling Energy- Efficient Unsupervised Monocular Depth Estimation on ARMv7-Based Platforms**
Design, Automation & Test in Europe Conference & Exhibition, Florence, Italy (DATE 2018)

[T5] **Learning monocular depth estimation with unsupervised trinocular assumptions**
International Conference on 3D Vision, Verona, Italy (3DV 2018)

[T4] **Beyond local reasoning for stereo confidence estimation with deep learning**
European Conference on Computer Vision, Munich, Germany (ECCV 2018)

[T3] **Generative Adversarial Networks for unsupervised monocular depth prediction**
European Conference on Computer Vision Workshop, Munich, Germany (ECCVW 2018)

[T2] **Quantitative evaluation of confidence measures in a machine learning world**
IEEE International Conference on Computer Vision, Venice, Italy (ICCV 2017)

[T1] **Learning confidence measures in the wild**
British Machine Vision Conference 2007 University of Warwick, UK (BMVC 2017)

Past and Ongoing Collaborations

Established a global network of strategic research collaborations spanning top academic institutions and industry leaders across Europe, Asia, and North America. These partnerships have resulted in joint publications, workshops, tutorials, and research projects in computer vision and deep learning.

Industry Partners

Google Zurich – Switzerland (Dr. Alessio Tonioni)
Multiple joint publications including self-adaptive deep stereo [P12] (Oral at CVPR 2019, extended to IEEE TPAMI [J12]), confidence measures in the wild [P3] (BMVC 2017), and NeRF-Supervised Deep Stereo [P33] (CVPR 2023)

Huawei Research - Finland (Jussi Yli-Äyhö)
Postdoctoral research (02/2021-02/2022) on RGB-MS matching and depth for transparent surfaces, resulting in 4 publications [P23, P26, P27, P25] including Best Paper Honorable Mention at 3DV 2021

Huawei Research - Zürich (Anton Obukhov)
Co-organization of MDEC workshop [W7] on monocular depth estimation at CVPR 2025 and ongoing research project on stereo novel view synthesis.

Sony Depthsensing Solutions – Belgium (Dr. Valerio Cambareri)
Collaboration on CabNIR benchmark for in-vehicle infrared depth estimation [P44] at WACV 2024

Niantic – United Kingdom (Gabriel J. Brostow, Michael Firman)
Co-organization of tutorial on monocular depth estimation in the wild [T3] at CVPR 2020

Oxa – United Kingdom (Jaime Spencer)
Co-organization of Monocular Depth Estimation Challenge workshops [W2, W7, P40, P29] at CVPR 2023-2025

Blue River Technology – United States (Ripudaman Singh Arora)
Collaboration on Monocular Depth Estimation Challenge [P40] at CVPR 2024

Rock Universe AI - China (Youmin Zhang)
Ongoing collaboration on 3D reconstruction with multiple joint publications [PP1, P45, P37, P24, J17] including GO-SLAM at ICCV 2023, depth super-resolution, and co-organization of NeuSLAM workshop [W6]

Eyecan.ai – Italy (Dr. Daniele De Gregorio)
Joint research on NeRF-Supervised Deep Stereo [P33] published at CVPR 2023

Academic Partners

Autonomous Vision Group – Max Planck Institute & University of Tübingen, Germany (Prof. Andreas Geiger)
Research visit (2020) resulting in SMD-Nets publication [P22] at CVPR 2021, featured in Computer Vision News Best of CVPR

ETH Zürich - Computer Vision Lab (Prof. Radu Timofte)
Co-organization of NTIRE workshops on transparent and reflective surfaces at CVPR 2023-2025 [W1, W3, W8, P32, P41]

ETH Zürich - Photogrammetry and Remote Sensing (Prof. Konrad Schindler, Tjark Behrens)
Ongoing research project on stereo novel view synthesis.

ETH Zürich - Computer Vision and Learning Group (Erik Sandström)
Collaboration on neural scene representation survey [PP1] and co-organization of NeuSLAM workshop [W6] at ECCV 2024

Korea University – South Korea (Prof. Seungryong Kim)
Joint publication on confidence in stereo matching [J10] in IEEE TPAMI

University of Amsterdam – Netherlands (Martin R. Oswald)
Collaboration on neural scene representation survey [PP1] and co-organization of NeuSLAM workshop [W6] at ECCV 2024

Koç University – Turkey (Asst. Prof. Fatma Güney)
Ongoing collaboration on 3D reconstruction, including self-evolving 3D Gaussian Splatting [P43] (Best Poster Award at BMVC 2024)

Stevens Institute of Technology – United States (Prof. Philippos Mordohai)
Co-organized tutorials [T1, T2, T4] and authored survey paper [J11] on machine learning for stereo in IEEE TPAMI

Oxford Internet Institute – United Kingdom (Chris Russell)
Collaboration on Monocular Depth Estimation Challenge [P28, P29, P40]

Zhejiang University – China (Yiyi Liao)
Joint publication on probabilistic stereo modeling [P22] at CVPR 2021 and co-organization of NeuSLAM workshop [W6] at ECCV 2024

University of Surrey – United Kingdom (Simon Hadfield, Richard Bowden)
Co-organization of MDEC workshop series [P28, P29, P40]

Politecnico di Torino – Italy (Prof. Andrea Calimera)
Research on energy-efficient deep learning for embedded devices resulting in multiple publications [P10, P16, J8, J9] in IEEE Internet of Things Journal and IEEE TCSVT

University of Padova – Italy (Prof. Pietro Zanuttigh)
Collaborative publication on depth sensors confidence estimation [J4] in IEEE Sensors Journal

University of Tuscia – Italy (Prof. Flavia Tauro, Prof. Salvatore Grimaldi)
Interdisciplinary research on environmental monitoring resulting in publications [J1, J2, J7] in Remote Sensing and Applied Sciences journals

Reviewing Service

Active peer reviewer for top-tier journals and conferences in computer vision and related fields, with recognition as Outstanding Reviewer at multiple premier venues.

†indicates Outstanding Reviewer

Conferences

Active reviewer for top-tier computer vision conferences, with multiple Outstanding Reviewer recognitions placing in the top 2%-6% of all reviewers.

CVPR, IEEE Conference on Computer Vision and Pattern Recognition, A++ GRIN Rank (2019, 2020, 2022, 2023†, 2024†, 2025†)

ECCV, European Conference on Computer Vision, A++ GRIN Rank (2020†, 2022, 2024†)

ICCV, IEEE International Conference on Computer Vision, A++ GRIN Rank (2019, 2021†, 2023)

3DV, International Conference on 3D Vision (2024)

ICIAP, International Conference on Image Analysis and Processing, B GRIN Rank (2021)

Outstanding Reviewer: CVPR 2025, CVPR 2024, CVPR 2023, ECCV 2024, ECCV 2020, ICCV 2021

Journals

TPAMI, IEEE Transactions on Pattern Analysis and Machine Intelligence

IJCV, International Journal of Computer Vision

TIP, IEEE Transactions on Image Processing

T-RO, IEEE Transactions on Robotics

JEI, Journal of Electronic Imaging

TNNLS, IEEE Transactions on Neural Networks and Learning Systems

IJDSN, International Journal of Distributed Sensor Networks

VISI, International Journal of Computer Vision

<div align="right">Workshops</div>

UAVision, 2nd International Workshop on Computer Vision for UAVs (CVPRW 2019)

TradiCV, 1st Workshop on Traditional Computer Vision in the Age of Deep Learning (ICCV 2021)

UNCV, 1st Workshop on Uncertainty Quantification for Computer Vision (ECCV 2022)

UAVision, 1st International Workshop on Computer Vision for UAVs (ECCV 2018)

NTIRE, New Trends in Image Restoration and Enhancement Workshop and Challenges (CVPR 2023, 2024)

PhD Supervision

<div align="right">2023-Ongoing</div>

Ugo Leone Cavalcanti - co-supervised with Stefano Mattoccia (University of Bologna)
Research focuses on advanced depth sensing solutions for in-cabin monitoring, exploring monocular depth estimation, multi-modal sensors beyond RGB, and novel view synthesis approaches including 3D Gaussian Splatting and Neural Radiance Fields (NeRF) for effective 3D reconstruction. PhD in conjunction with Sony Depthsensing Solutions – Belgium (Dr. Valerio Cambareri).

Co-Supervised Students (non-exhaustive list)

Master Theses https://amslaurea.unibo.it/view/relatore/Tosi=3AFabio=3A=3A/

De Nardi, Dario "Design and implementation of an Advanced Driver Assistance System on a racing prototype in the marine environment using stereo vision and Convolutional Neural Networks.", Università di Bologna, Corso di Studio in Ingegneria informatica [LM-DM270]

Lo Russo, Andrea "Reti neurali monoculari per la stima della profondità di superfici non-Lambertiane", Università di Bologna, Corso di Studio in Ingegneria informatica [LM-DM270]

Malizia, Chiara "High-Resolution Monocular Depth Estimation with Stereo Proxy Supervision", Università di Bologna, Corso di Studio in Artificial intelligence [LM-DM270]

Bartolomei, Luca "Percezione depth guidata mediante proiezione virtuale di pattern", Università di Bologna, Corso di Studio in Ingegneria informatica [LM-DM270]

Costanzino, Alex "Mitigating non-Lambertian surfaces issues in Stereo Matching with Neural Radiance Fields", Università di Bologna, Corso di Studio in Artificial intelligence [LM-DM270]

Pumilia, Andrea "Metodologie di Corrispondenza Stereo Basate su Deep Learning per Superfici Altamente Riflettenti e Trasparenti: Dataset e Architettura", Università di Bologna, Corso di Studio in Ingegneria elettronica e telecomunicazioni [L-DM270]

Laminetti, Giordano "Depth estimation using deep learning and SLAM", Università di Bologna, Corso di Studio in Ingegneria informatica [LM-DM270]

Mingozzi, Alessio "Monitoraggio del distanziamento sociale mediante singola telecamera", Università di Bologna, Corso di Studio in Ingegneria informatica [LM-DM270]

Conti, Andrea "Diving between depth prediction and depth completion", Università di Bologna, Corso di Studio in Ingegneria informatica [LM-DM270]

Benincasa, Antonio "Deep-learning per stima della confidenza di mappe depth", Università di Bologna, Corso di Studio in Ingegneria informatica [LM-DM270]

Boschini, Matteo "Unsupervised Learning of Scene Flow", Università di Bologna, Corso di Studio in Ingegneria informatica [LM-DM270]

Mangiocco, Armando "Studio, sviluppo e ottimizzazione di algoritmi di visione 3D per applicazioni real-time", Università di Bologna, Corso di Studio in Ingegneria informatica [LM-DM270]

Pallotti, Davide "Integrazione di dati di disparità sparsi in algoritmi per la visione stereo basati su deep-learning", Università di Bologna, Corso di Studio in Ingegneria informatica [LM-DM270]

Presutti, Pasquale "Algoritmo per la generazione di mappe depth da immagini stereo con CNN", Università di Bologna, Corso di Studio in Ingegneria informatica [LM-DM270]

Rossetto, Andrea "CNN per view synthesis da mappe depth", Università di Bologna, Corso di Studio in Ingegneria informatica [LM-DM270]

Open Source & Software Projects

Actively contributing to the computer vision community through development and maintenance of open-source repositories, benchmarks, and comprehensive resource collections. These implementations provide the code base for published research, enabling reproducibility and facilitating adoption of novel methods.

Chronological Implementation List

[C30] **Stereo Anywhere** (2025)
https://github.com/bartn8/stereoanywhere/
Implementation of robust zero-shot deep stereo matching that performs reliably even when either stereo or mono methods fail, to be published at CVPR 2025 [P46].

[C29] **HS-SLAM** (2025)
https://zorangong.github.io/HS-SLAM/
Implementation of hybrid representation with structural supervision for improved dense SLAM, to be published at ICRA 2025 [P45].

[C28] **StereoGS** (2024)
https://github.com/sadrasafa/StereoGS/
Implementation of a self-improving depth-aware 3D Gaussian Splatting framework [P43], published at BMVC 2024 (Best Poster Award)

[C27] **Diffusion4RobustDepth** (2024)
https://github.com/fabiotosi92/Diffusion4RobustDepth
Official code for diffusion-based monocular depth estimation that overcomes challenging conditions, published at ECCV 2024 [P42].

[C26] **Cross-Domain Depth Completion** (2024)
https://github.com/bartn8/vppdc
Implementation for depth completion from a stereo matching perspective for cross-domain generalization, published at 3DV 2024 [P38].

[C25] **Federated Online Adaptation for Deep Stereo** (2024)
https://github.com/mattpoggi/fedstereo
Implementation of a distributed framework for collaborative adaptation of stereo networks across multiple devices, enabling improved performance on resource-constrained systems, published at CVPR 2024 [P39].

[C24] **VPP** (2023)
https://github.com/bartn8/vppstereo
Implementation of active stereo in the wild through virtual pattern projection, published at ICCV 2023 [P36].

[C23] **GO-SLAM** (2023)
https://github.com/youmi-zym/GO-SLAM
Implementation of a global optimization approach for consistent 3D instant reconstruction, published at ICCV 2023 [P37].

[C22] **Depth4ToM** (2023)
https://github.com/CVLAB-Unibo/Depth4ToM
Repository for learning depth estimation for transparent and mirror surfaces, related to the work published at ICCV 2023 [P34].

[C21] **NeRF-Supervised Deep Stereo** (2023)
https://github.com/fabiotosi92/NeRF-Supervised-Deep-Stereo
Official implementation of a novel approach using Neural Radiance Fields to supervise stereo matching networks, published at CVPR 2023 [P33].

[C20] **RGB-MS Cross-Domain Matching** (2022)

https://cvlab-unibo.github.io/rgb-ms-web/

Implementation and dataset for cross-domain matching between RGB and multispectral images, published at CVPR 2022 [P27].

[C19] **The Booster Benchmark** (2022)

https://cvlab-unibo.github.io/booster-web/

Implementation of the first public benchmark for stereo depth estimation on transparent and reflective surfaces, published at CVPR 2022 [P26] and IEEE TPAMI [J14].

[C18] **MonoViT** (2022)

https://github.com/zxcqlf/MonoViT

Implementation of a novel framework combining Vision Transformers with self-supervised monocular depth estimation, enabling both local and global reasoning for improved accuracy, published at 3DV 2022 [P24].

[C17] **Neural Disparity Refinement** (2021, 2024)

https://github.com/CVLAB-Unibo/neural-disparity-refinement

Implementation of a framework for refining disparity maps at arbitrary resolution, presented as ORAL at 3DV 2021 [P23] (Best Paper Honorable Mention Award) and extended in IEEE TPAMI [J15].

[C16] **SMD-Nets: Stereo Mixture Density Networks** (2021)

https://github.com/fabiotosi92/SMD-Nets

Implementation of a probabilistic stereo matching framework that enhances disparity accuracy near discontinuities and enables ultra high-resolution depth estimation. Published at CVPR 2021 [P22] and featured in Computer Vision News Best of CVPR.

[C15] **Monocular Depth Uncertainty** (2020)

https://github.com/mattpoggi/mono-uncertainty

Implementation of the first framework for uncertainty estimation in self-supervised monocular depth, improving depth accuracy across different training paradigms, published at CVPR 2020 [P18].

[C14] **OmegaNet** (2020)

https://github.com/CVLAB-Unibo/omeganet

Implementation of distilled semantics for comprehensive scene understanding from videos, published at CVPR 2020 [P19].

[C13] **Reversing the Cycle** (2020)

https://github.com/FilippoAleotti/Reversing

Implementation of self-supervised deep stereo through an enhanced monocular distillation technique, published at ECCV 2020 [P21].

[C12] **DWARF: Scene Flow Learning** (2020)

https://github.com/FilippoAleotti/DWARF-Tensorflow

TensorFlow implementation of end-to-end scene flow estimation through knowledge distillation from single tasks, published at AAAI 2020 [P15].

[C11] **Real-Time Self-Adaptive Deep Stereo** (2019, 2022)

https://github.com/CVLAB-Unibo/Real-time-self-adaptive-deep-stereo

Implementation for continuous adaptation of deep stereo models, presented as ORAL at CVPR 2019 [P12] and extended in IEEE TPAMI [J12].

[C10] **Learning Monocular Depth with Stereo Knowledge** (2019)

https://github.com/fabiotosi92/monoResMatch-Tensorflow

TensorFlow implementation of a framework for infusing traditional stereo knowledge into monocular depth estimation, published at CVPR 2019 [P13].

[C9] **Mobile PyDNet** (2018)

https://github.com/FilippoAleotti/mobilePydnet

Optimized implementation of real-time monocular depth estimation for handheld devices, demonstrating depth perception capabilities on resource-constrained mobile platforms [P6, J6].

[C8] **Local-Global Confidence (LGC)** (2018)
https://github.com/fabiotosi92/LGC-Tensorflow
Implementation of multi-stage cascaded network for stereo confidence estimation combining local and global reasoning, outperforming state-of-the-art techniques, published at ECCV 2018 [P7].

[C7] **Semantic Monocular Depth** (2018)
https://github.com/CVLAB-Unibo/Semantic-Mono-Depth
Implementation of semi-supervised approach that jointly tackles depth prediction and semantic segmentation to improve depth estimation accuracy, published at ACCV 2018 [P8].

[C6] **PyDNet** (2018)
https://github.com/mattpoggi/pydnet
Implementation of lightweight network for real-time unsupervised monocular depth estimation on CPU and embedded systems, achieving efficient inference with comparable accuracy, published at IROS 2018 [P6].

[C5] **3Net** (2018)
https://github.com/mattpoggi/3net
Implementation of monocular depth estimation with unsupervised trinocular assumptions, addressing typical stereo artifacts through a novel interleaved training procedure, published at 3DV 2018 [P9].

[C4] **Optical Tracking Velocimetry** (2018)
https://github.com/fabiotosi92/Optical-Tracking-Velocimetry
Implementation of the OTV methodology for surface streamflow observations, allowing environmental monitoring from image sequences [J1].

[C3] **Unsupervised Confidence Measures** (2017)
https://github.com/fabiotosi92/Unsupervised-Confidence-Measures
Implementation of self-supervised methodology for training confidence measures without ground-truth labels, applicable across different datasets and stereo algorithms, published at BMVC 2017 [P3].

[C2] **Confidence CNN** (2017)
https://github.com/fabiotosi92/CCNN-Tensorflow
TensorFlow implementation of the confidence measure for the stereo matching framework.

Resource Collections

[C1] **Awesome Deep Stereo Matching**
https://github.com/fabiotosi92/Awesome-Deep-Stereo-Matching
Curated and maintained collection of deep stereo matching papers, code, and resources that has become a standard reference point for researchers in the field. Includes comprehensive categorization of methods, datasets, and benchmarks with over 300 papers and implementations.

I hereby declare that the information provided in this Curriculum Vitae is true and complete to the best of my knowledge.
I authorize the processing of my personal data in compliance with applicable privacy regulations.

Date
May 9, 2025

Signature