STEFANO MATTOCCIA

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EDUCATION

- PhD in Computer Science Engineering, University of Bologna (2002)
- M.S. in Electronic Engineering, University of Bologna (1997)

ACADEMIC POSITIONS

- Associate Professor, with scientific habilitation 09/H1 for the role of full professor, Department of Computer Science and Engineering, University of Bologna (Oct. 2015 – present)
- Assistant Professor, Department of Computer Science and Engineering, University of Bologna (Jan. 2004 – Sep. 2015)
- Postdoc Researcher, Department of Computer Science and Engineering, University of Bologna (Feb. 2002 – Dec. 2003)

RESEARCH INTERESTS

- Computer vision/3D vision
- Machine-learning/deep-learning
- Scene perception from images and sensors
- Domain adaptation
- Embedded computer vision

RESEARCH GROUP

Our research group is mostly focused on learning-based techniques for depth perception and more in general scene understanding frome images. Members:

- Prof. Stefano Mattoccia (Associate professor)
- Dr Matteo Poggi, Tenure-Track Assistant professor (RTD-B)
- Dr Fabio Tosi, Junior Assistant Professor (RTD-A)
- Huan Li, 3rd year PhD student
- Luca Bartolomei, 3rd year PhD student
- Alessio Mingozzi, 3rd year PhD student
- Enrico Mannocci, 2nd year PhD student
- Ugo Leone Cavalcanti, , 2nd year PhD student
- Ziren Gong, , 2nd year PhD student awarded with a grant from the University of Bologna and China Scholarship Council
- Ninghui Xu, visiting PhD student
- Xiaohan Li, visiting PhD student

Former members:
- Andrea Conti, now at SONY Depthsensing (Brussels, Belgium)
- Youmin Zhang, co-founder of Rock Universe
- Fan Rizhao, now at Research Institute of Mine Artificial Intelligence, China Coal Research Institute, (Beijing, China)
- Dr Filippo Aleotti, now at Niantic (London, UK)

Former supervised visiting PhD students awarded with a China Scholarship Council scholarship:

- Xiaohan Li, from Institute of Advanced Technology, University of Science and Technology of China (Oct 2024 – Oct 2025)
- Chaoqiang Zhao, from East China University of Science and Technology, Shanghai (Oct. 2021 – Nov 2022)
- Xin Qiao, from the Xi'an Jiaotong University, China (Oct. 2021 – Nov 2022)
- Li Zhang, from the College of Information and Electrical Engineering, China Agricultural University (Oct 2019 – April 2021)
- Yuan Shen, from Beihang University (8 months, Sep 2019 – May 2020)

SEMINARS, TALKS, TUTORIALS, COURSES and DEMOS

- **Demo:** Robust Zero-Shot Depth Perception through Mono-Stereo Fusion, L. Bartolomei, M. Poggi, F. Tosi, S. Mattoccia, **CVPR 2025**
- **Demo:** Multi-Setup Depth Perception through Virtual Image Hallucination, L. Bartolomei, M. Poggi, F. Tosi, A. Conti, S. Mattoccia, **ECCV 2024**
- **Demo:** Robust depth perception through Virtual Pattern Projection, L. Bartolomei, M. Poggi, F. Tosi, A. Conti, S. Mattoccia, **CVPR 2024**
- **Talk**: Deep learning for scene perception from images, Artificial Intelligence and Smart Mobility, Autodromo di Imola, September 12, 2023
- **Demo:** Scene perception from images with deep-learning, **EXPO 2020/22** Dubai
- **Talk:** Scene perception from images with deep-learning, TU Wien - Vienna University of Technology, March 24, 2021
- **Talk**: Depth sensing technologies for autonomous vehicles, Master in Sustainable and Integrated Mobility in Urban Regions, University of Bologna, Imola (Bologna), February 2021
- **Tutorial:** Facing depth estimation in-the-wild with deep networks, M. Poggi, F. Tosi, F. Aleotti, K. Batsos, P. Mordohai, S. Mattoccia, **ECCV 2020**
- **Tutorial:** Learning and understanding single image depth estimation in the wild, M. Poggi, F. Tosi, F. Aleotti, S. Mattoccia, C. Godard, J. Watson, M. Firman, G. J. Brostow, **CVPR 2020**
- **Talk**: Depth sensing technologies for autonomous vehicles, Master in Sustainable and Integrated Mobility in Urban Regions, University of Bologna, Imola (Bologna), October 2019
- **Tutorial**: Learning-based depth estimation from stereo and monocular images: successes, limitations and future challenges, M. Poggi, F. Tosi, K. Batsos, P. Mordohai, S. Mattoccia, **CVPR 2019**, Long Beach, USA, June 17, 2019
- **Demo**: Real-time monocular depth estimation without GPU, M. Poggi, F. Tosi, F. Aleotti, S. Mattoccia, CVPR 2019, Long Beach, USA, June 18-20, 2019
- **Demo**: Real-time self-adaptive deep stereo, with A. Tonioni, F. Tosi, M. Poggi, S. Mattoccia, L. Di Stefano, CVPR 2019, Long Beach, USA, June 18-20, 2019
- **Course**: Computer vision and machine learning, EMBA | Bologna Business School, Bologna, May 17, 2019
- **Demo**: Energy-Efficient Monocular Depth Estimation on ARM-based Embedded Platforms, V. Peluso, A. Cipolletta, A. Calimera, M. Poggi, F. Tosi, S. Mattoccia, U-booth at DATE 2019, March 2019, Florence, Italy

- **Talk**: Real-time depth from images with deep-learning, EON Experience Fest 2019, March 28, 2019, Bologna
- **PhD Course**: Learning-Based dense Depth Estimation from Stereo and Monocular Images, Jan/Feb 2019, Department of Computer Science and Engineering, University of Bologna
- **Talk**: Learning-based methods for depth from images and confidence estimation, Naver Labs Europe, Grenoble (France), December 14, 2018, Invited by Dr Martin Humenberger
- **Tutorial**: Learning-based depth estimation from stereo and monocular images: successes, limitations and future challenges, M. Poggi, F. Tosi, K. Batsos, P. Mordohai, S. Mattoccia, **3DV 2018**, Verona, Italy, September 8, 2018
- **Demo**: Towards Real-time Learning of Monocular Depth Estimation Enabling Multiple View Synthesis on CPU, M. Poggi, F. Tosi, S. Mattoccia, European Conference on Computer Vision (ECCV2018), September 10, 2018, Munich, Germany
- **Talk**: 3D Sensing from Images, M. Poggi, F. Tosi, S. Mattoccia, European Machine Vision Forum 2018, Bologna, Italy, September 6, 2018
- **Demo**: Towards real-time monocular and unsupervised depth estimation on CPU, M. Poggi, F. Aleotti, F. Tosi, S. Mattoccia International Conference on 3D Vision (3DV2018), September 5-7, 2018, Verona, Italy
- **Talk**: Deep-learning for depth estimation, TU Graz, Graz University of Technology - Institute of Computer Graphics & Vision, April 17, 2018
- **Talk**: Deep-learning for low-level vision problems, Summer School on Deep Learning on Chip (Macloc2017) September 20-22, 2017 – Politecnico di Torino, Torino (Italy)
- **Talk**: Mapping of computer vision algorithms on FPGAs with High-Level Synthesis tools, Summer School on Deep Learning on Chip (Macloc2017) September 20-22, 2017 – Politecnico di Torino, Torino (Italy)
- **PhD Course**: Stereo vision, May 2016, Department of Computer Science and Engineering, University of Bologna
- **Course**: Sensing 3D for embedded systems, Embedded Vision Systems School, CVPRLab, University of Naples Parthenope May 25,26, 2015
- **Talk**: Stereo vision algorithms for FPGAs, invited talk at 9th IEEE Embedded Vision Workshop (CVPR 2013), Portland, Oregon, June 2013
- **Talk**: Accurate and fast dense stereo vision algorithms: recent trends and open problems, Philips High Tech Campus, Eindhoven, Netherlands, June 2012
- **Seminar**: Introduction to stereo vision, University of Florence, May 2012
- **Seminar**: Stereo vision algorithms for 3D dense reconstruction: introduction and recent trends, University of Florence, May 2012
- **Seminars**: Stereo vision algorithms, Design methodologies for reconfigurable devices and Parallel computer architectures and development tools, VIALAB project, T3Lab Bologna, Italy, 2011/2012
- **Seminar**: Real-time stereo vision: recent trends and applications, Philips Consumer Lifestyle, Drachten, Netherlands, April 2009
- **Seminar**: Stereo vision algorithms, University of Bologna, Italy. Within project DISTEF with IMA S.p.a, March 2008
- **Seminar:** Stereo vision: algorithms and applications, Robotics and Mechatronics Group, University of Twente, Enschede, the Netherlands, April 2009
- **Seminar**: Methodologies and algorithms to infer 3D data from binocular images, Centro Italiano di Ricerche Aerospaziali (CIRA), Capua (CE), Italy, November 2007

PUBLICATIONS (2024~2016)

The complete list is available at this link: http://vision.disi.unibo.it/~smatt/Site/Publications.html

1) L. Bartolomei, M. Poggi, F. Tosi, A. Conti, S. Mattoccia, "Active Stereo in the Wild through Virtual Pattern Projection", **International Journal of Computer Vision (IJCV)**, accepted 2025

2) H. Li, . Poggi, F. Tosi, S. Mattoccia, "Self-supervised Monocular Depth Estimation for Dynamic Objects with Ground Propagation", oral presentation at IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS 2025**), October 19–25, 2025, Hangzhou, China

3) A. Mingozzi, S. Mattoccia, M. Poggi, F. Güney, "Zero-Shot Neural Architecture Search for Efficient Deep Stereo Matching", 23rd International Conference on Image Analysis and Processing (ICIAP 2025), Rome, Italy, September 15-19, 2025

4) 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 2025**), Nashville, USA, June 11 – 15, 2025

5) P. Zama Ramirez, F. Tosi, L.i Di Stefano, R. Timofte, A. Costanzino, M. Poggi, S. Salti, S. Mattoccia, Z. Zhang, Y. Yang, W. Chen, A. Ming, M. Zhao, M. Yu, S. Gao, X. Wang, F. Xue, J. Shi, Y. Yang, Y. A, Y. Jin, D. Li, A. Shukla, L. Frija-Altarac, M. Toews, H. Geng, T. Wan, Z. Gao, Q. Xu, K. Xu, Z. Zang, J. Babu Pinjari, K. Purohit, M. Lavreniuk, J. Cao, S.i Li, K. Jiang, J. Jiang, Y. Huang, "NTIRE 2025 Challenge on HR Depth from Images of Specular and Transparent Surfaces", New Trends in Image Restoration and Enhancement workshop and associated challenges (NTIRE 2025), CVPR Workshop, Nashville, Tennessee, USA, June 11, 2025

6) 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 & Automation (**ICRA 2025**), Atlanta, Georgia, May 19 – 23, 2025

7) E. Mannocci, M. Poggi, S. Mattoccia, "Drive with the flow", IEEE International Conference on Robotics & Automation (**ICRA 2025**), Atlanta, Georgia, May 19 – 23, 2025

8) U. L. 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 2025**), Tucson, Arizona, Feb. 28 – Mar. 4, 2025

9) L. Bartolomei, M. Poggi, A. Conti, S. Mattoccia, "LiDAR-Event Stereo Fusion with Hallucinations", European Conference on Computer Vision (**ECCV 2024**), Milano, Italy, Sep 29th – Oct 4th, 2024

10) A. Conti, M. Poggi,, V. Cambareri, S. Mattoccia, "Depth on Demand: Streaming Dense Depth from a Low Frame Rate Active Sensor", European Conference on Computer Vision (**ECCV 2024**), Milano, Italy, Sep 29th – Oct 4th, 2024

11) R. Fan, M. Poggi, S. Mattoccia, "Exploring Few-Beam LiDAR Assistance in Self-Supervised Multi-Frame Depth Estimation", IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS 2024**), October 14 –18, 2024, Abu Dhabi, UAE

12) F. Tosi, F. Aleotti, P. Zama Ramirez, M. Poggi, S. Salti, S. Mattoccia, L. Di Stefano, "Neural Disparity Refinement", **IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)**, accepted 2024

13) X. Qiao, M. Poggi, P. Deng, H. Wei, C. Ge, S. Mattoccia, "RGB Guided ToF Imaging System: A Survey of Deep Learning-based Methods", **International Journal of Computer Vision (IJCV)**, Volume 132, pages 4954–4991, (2024)

14) M. Poggi, F. Arrigoni, A. Fusiello, S. Mattoccia, A. Bartoli, T. Sattler, T. Pajdla, "Guest Editorial: Special Issue on Traditional Computer Vision in the Age of Deep Learning", **International Journal of Computer Vision (IJCV)**, 2024

15) P. Zama Ramirez, F. Tosi, L. Di Stefano, R. Timofte, A. Costanzino, M. Poggi, S. Salti, S. Mattoccia, Y. Zhang, C. Wu, Z. He, S. Yin, J. Dong, Y. Liu, H. Jiang, J. Shi, Y. A, Y. Jin, D. Li, B. Ke, A. Obukhov, T. Wang, N. Metzger, S. Huang, K. Schindler, Y. Huang, J. Li, J. Zhang, Y. Wang, Z. Huang, T. Liu, Z. Cao, P. Li, J. Wang, W. Zhu, H. Geng, Y. Zhang, L. Lan, K. Xu, T.

Sun, Q. Xu, S. Saini, A. Gupta, S. K. Mistry, A. Shukla, V. Jakhetiya, S. Jaiswal, Y. Sun, Z. Zheng, Y. Ning, J. Cheng, H. Liu, H. Huang, C. Yang, Z. Jiang, Y. Peng, A. Huang, J. Hwang, "NTIRE 2024 Challenge on HR Depth from Images of Specular and Transparent Surfaces", New Trends in Image Restoration and Enhancement (NTIRE 2924), CVPR Workshop, Seattle (USA), June 17, 2024

16) L. Bartolomei, M. Poggi, A. Conti, F. Tosi, S. Mattoccia, "Revisiting depth completion from a stereo matching perspective for cross-domain generalization", International Conference on 3D Vision 2024 (**3DV 2024**), Davos, Switzerland, March 18–21, 2024

17) A. Conti, M. Poggi, V. Cambareri, S. Mattoccia, "Range-agnostic multi-view depth estimation with keyframe selection", International Conference on 3D Vision 2024 (**3DV 2024**), Davos, Switzerland, March 18–21, 2024

18) P. Zama Ramirez, A. Costanzino, F. Tosi, M. Poggi, S. Salti, S. Mattoccia, L. Di Stefano, "Booster: a benchmark for depth from images of specular and transparent surfaces", **IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)**, Volume: 46, Issue 1, pages: 85 – 102, January 2024

19) 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**, , Volume 237, December 2023, 103841

20) X. Qiao, C. Ge, C. Zhao, F. Tosi, M. Poggi, S. Mattoccia, "Self-supervised depth super-resolution with contrastive multiview pre-training", **Neural Networks**, , Volume 168, November 2023, Pages 223-236

21) H. Li, M. Poggi, F. Tosi, S. Mattoccia, "On-site adaptation for monocular depth estimation with a static camera", oral presentation at the 34th British Machine Vision Conference (**BMVC2023**), 20th - 24th November 2023, Aberdeen, UK

22) R. Fan, F. Tosi, M. Poggi, S. Mattoccia, "Lightweight self-supervised depth estimation with few-beams LiDAR data", The 34th British Machine Vision Conference (**BMVC2023**), 20th - 24th November 2023, Aberdeen, UK

23) L. Bartolomei, M. Poggi, F. Tosi, A. Conti, S. Mattoccia, "Active stereo without pattern projector", IEEE/CVF International Conference on Computer Vision (**ICCV 2023**), Paris, France, October 4-6, 2023

24) Y. Zhang, F. Tosi, S. Mattoccia, M. Poggi, "GO-SLAM: Global Optimization for consistent 3D instant reconstruction", IEEE/CVF International Conference on Computer Vision (**ICCV 2023**), Paris, France, October 4-6, 2023

25) C. Zhao, M. Poggi, F. Tosi, I. Zhou, Q. Sun, Y. Tang, S. Mattoccia, "GasMono: geometry-aided self-supervised monocular depth estimation for indoor scenes", IEEE/CVF International Conference on Computer Vision (**ICCV 2023**), Paris, France, October 4-6, 2023

26) A. Costanzino, P. Zama Ramirez, M. Poggi, F. Tosi, S. Mattoccia, L. Di Stefano, "Learning depth estimation for transparent and mirror surfaces", IEEE/CVF International Conference on Computer Vision (**ICCV 2023**), Paris, France, October 4-6, 2023

27) Y. Zhang, M. Poggi, S. Mattoccia, "TemporalStereo: efficient spatial-temporal Stereo matching network", IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS 2023**), Detroit, Michigan USA, October 1-5, 2023

28) X. Qiao, C. Ge, P. Deng, H. Wei, M. Poggi, S. Mattoccia, "Depth restoration in under-display Time-of-Flight imaging", **IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)**, Volume 45, Issue 5, pages: 5668 - 5683, May 2023

29) Y. Zhang, X. Guo, M. Poggi, Z. Zhu, G. Huang, S Mattoccia, "CompletionFormer: depth completion with convolutions and vision transformers", IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR 2023**), Vancouver, Canada, June 18-22, 2023

30) R. Fan, M. Poggi, S. Mattoccia, "Contrastive learning for depth prediction", End-to-End Autonomous Driving: Perception, Prediction, Planning and Simulation (E2EAD) — CVPR 2023 Workshop, Vancouver, Canada, June 18, 2023

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", 2nd Monocular Depth Estimation Challenge (MDEC) — CVPR 2023 Workshop, Vancouver, Canada, June 18, 2023

31) P. Zama Ramirez, F. Tosi, L. Di Stefano, R. Timofte, A. Costanzino, M. Poggi, S. Salti, S. Mattoccia, J. Shi, D. Zhang, Y. A, Y. Jin, D. Li, C. Li, Z. Liu, Q. Zhang, Y. Wang, S. Yin, "NTIRE 2023 Challenge on HR Depth From Images of Specular and Transparent Surfaces", 8th New Trends in Image Restoration and Enhancement Workshop and Challenges — CVPR 2023 Workshop, Vancouver, Canada, June 18, 2023

32) A. Conti, M. Poggi, S. Mattoccia, "Sparsity Agnostic depth completion", IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV 2023**), Waikoloa, Hawaii (USA), January 3–7, 2023

33) J. Spencer, C. Stella Qian, C. Russell, S. Hadfield, E. Graf, W. Adams, A. J. Schofield, J. Elder, R. Bowden, H. Cong, S. Mattoccia, M. Poggi, Z. Khan Suri, Y. Tang, F. Tosi, H. Wang, Y. Zhang, Y. Zhang, C. Zhao, "The Monocular Depth Estimation Challenge", Monocular Depth Estimation Challenge Workshop held in conjunction with IEEE/CVF Winter Conference on Applications of Computer Vision (WACV 2023),, Waikoloa, Hawaii (USA), January 7, 2023

34) P. Kaniewski, M. Pasternak, S. Mattoccia, "Special issue on Multi-Sensor Systems and Data Fusion in Remote Sensing", Remote Sensing, March 2023

35) R. Fan; Z. Li, M. Poggi, S. Mattoccia, "A Cascade Dense Connection Fusion Network for Depth Completion", 33rd British Machine Vision Conference (**BMVC 2022**), 21 - 24 November 2022, London, UK

36) A. Conti, M. Poggi, F. Aleotti, S. Mattoccia, "Unsupervised confidence for LiDAR depth maps and applications", IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS 2022**), Kyoto, Japan, October 23–27, 2022

37) M. Poggi, A. Conti, S. Mattoccia, "Multi-view Guided Multi-view Stereo", IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS 2022**), Kyoto, Japan, October 23–27, 2022

38) C. Zhao, Y. Zhang, M. Poggi, F. Tosi, X. Guo, Z. Zhu, G. Huang, Y. Tang, S. Mattoccia, "MonoViT: Self-Supervised Monocular Depth Estimation with a Vision Transformer", International Conference on 3D Vision (**3DV2022**), Prague, Czechia, September 12-15, 2022

39) M. Poggi, P. Zama Ramirez, F. Tosi, S. Salti, S. Mattoccia, L. Di Stefano, "Cross-Spectral Neural Radiance Fields", International Conference on 3D Vision (**3DV2022**), Prague, Czechia, September 12-15, 2022

40) P. Zama Ramirez, F. Tosi, M. Poggi, S. Salti, S. Mattoccia, L. Di Stefano, "Open challenges in deep stereo: the Booster dataset", IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR 2022**), New Orleans, USA, June 19-24, 2022

41) F. Tosi, P. Zama Ramirez, M. Poggi, S. Salti, S. Mattoccia, L. Di Stefano, "RGB-Multispectral matching: dataset, learning methodology, evaluation", IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR 2022**), New Orleans, USA, June 19-24, 2022

42) S. Kim*, M. Poggi*, S. Kim, K. Sohn, S. Mattoccia, "Meta-confidence estimation for stereo matching", IEEE/RSJ International Conference on Robotics and Automation (**ICRA 2022**), May 23-27, 2021, Philadelphia (PA), USA

43) A. Mingozzi, A. Conti, F. Aleotti, M. Poggi, S. Mattoccia, "Monitoring social distancing with single image depth estimation", **IEEE Transactions on Emerging Topics in Computational Intelligence**, Volume 6, Issue 6, pages 1290 - 1301, December 2022

44) M. Poggi, F. Tosi, F. Aleotti, S. Mattoccia, "Real-time monocular depth estimation without GPU", **IEEE Transactions on Intelligent Transportation Systems**, Volume 23, Issue 10, October 2022, pp 17342 - 17353

45) F. Aleotti, F. Tosi, P. Zama Ramirez, M. Poggi, S. Salti, S. Mattoccia, L. Di Stefano, "Neural Disparity Refinement for Arbitrary Resolution Stereo", oral presentation at International Conference on 3D Vision (**3DV 2021**), virtual, December 1-3, 2021 (**BEST PAPER AWARD HONORABLE MENTION**)

46) M. Poggi, F. Aleotti, S. Mattoccia, "Sensor-Guided Optical Flow", IEEE/CVF International Conference on Computer Vision (**ICCV 2021**), virtual October 11-17, 2021

47) M. Poggi, A. Tonioni, F. Tosi, S. Mattoccia, L. Di Stefano, "Continual adaptation for deep stereo", **IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)**, Volume 44, Issue 9, September 2022, pp 4713 - 4729

48) M. Poggi, F. Tosi, K. Batsos, P. Mordohai, S. Mattoccia, "On the synergies between machine learning and binocular stereo for depth estimation from images: a survey", **IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)**, Volume 44, Issue 9, September 2022, pp 5314 - 5334

49) M. Poggi, S. Kim, F. Tosi, S. Kim, F. Aleotti, D. Min, K. Sohn, S. Mattoccia , "On the confidence of stereo matching in a deep-learning era: a quantitative evaluation", **IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)**, Volume 44, Issue 9, September 2022, pp 5293 - 5313

50) A. Cipolletta, V. Peluso, A. Calimera, M. Poggi, F. Tosi, F. Aleotti, S. Mattoccia, "Energy-Quality Scalable Monocular Depth Estimation on Low-Power CPUs", **IEEE Internet of Things Journal (IoT-J)**

51) V. Peluso, A. Cipolletta, A. Calimera, M. Poggi, F. Tosi, F. Aleotti, S. Mattoccia, "Monocular depth perception on microcontrollers for edge applications", **IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)**, Vol. 32, Issue 3, March 2022, pp 1524-1536, DOI: 10.1109/TCSVT.2021.3077395

52) M. Poggi, F. Aleotti, S. Mattoccia, "Learning optical flow from still images", IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR 2021**), virtual, June 19-25, 2021

53) D. De Gregorio, M. Poggi, P. Zama Ramirez, G. Palli, S. Mattoccia, L. Di Stefano, "Beyond the baseline: 3D reconstruction of tiny objects with single camera stereo robot", **IEEE Access**, IEEE Access, Vol. 9, pages 119755-119765, August 2021

54) F. Aleotti, G. Zaccaroni, L. Bartolomei, M. Poggi, F. Tosi, S. Mattoccia, "Real-time single image depth perception in the wild with handheld devices", **Sensors** 2021, 21(1), 15

55) P. Tassinari, M. Bovo, S. Benni, S. Franzoni, M. Poggi, L. Maria, E. Mammi, S. Mattoccia, L Di Stefano, F. Bonora, A. Barbaresi, E. Santolini, D. Torreggiani, "A computer vision approach based on deep learning for the detection of dairy cows in free stall barn", Computers and Electronics in Agriculture, Volume 182, March 2021

56) 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", MDPI Applied Sciences, 2021

57) C. Cai, M. Poggi, S. Mattoccia, P. Mordohai, "Matching-space stereo networks for cross-domain generalization", 8th International Virtual Conference on 3D Vision (**3DV 2020**), November 25-28, 2020, virtually in Fukuoka, Japan

58) F. Aleotti, F. Tosi, L. Zhang, M. Poggi, S. Mattoccia, "Reversing the cycle: self-supervised deep stereo through enhanced monocular distillation", 16th European Conference on Computer Vision (**ECCV 2020**), 23-28 August 2020, Glasgow, UK (Virtual)

59) M. Poggi F. Aleotti, F. Tosi, G. Zaccaroni, S. Mattoccia, "Self-adapting confidence estimation for stereo", 16th European Conference on Computer Vision (**ECCV 2020**), 23-28 August 2020, Glasgow, UK (Virtual)

60) M. Poggi, F. Tosi, F. Aleotti, S. Mattoccia, "Leveraging a weakly adversarial paradigm for joint learning of disparity and confidence estimation", 25th International Conference on Pattern Recognition (**ICPR 2020**), January 10-15, 2021, Milan, Italy (Virtual)

61) M. Poggi, F. Aleotti, F. Tosi and S. Mattoccia, "On the uncertainty of self-supervised monocular depth estimation", IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR 2020**), June 16-18, 2020, Seattle, Washington, USA (Virtual)

62) F. Tosi, F. Aleotti, P. Zama Ramirez, M. Poggi, S. Salti, L. Di Stefano and S. Mattoccia, "Distilled semantics for comprehensive scene understanding from videos", IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR 2020**), June 16-18, 2020, Seattle, Washington, USA (Virtual)

63) V. Peluso, A. Cipolletta, A. Calimera, M. Poggi, F. Tosi, F. Aleotti, S. Mattoccia, "Enabling monocular depth perception at the very edge", 2020 Low-Power Computer Vision Challenge (LPCVC) held in conjunction with CVPR 2020, June 15, 2020, Seattle, Washington, USA (Virtual)

64) M. Poggi, F. Tosi, S. Mattoccia, "Good cues to learn from scratch a confidence measure for passive depth sensors", **IEEE Sensors** Journal, 20(22), pp 13533-13541, November 15, 2020, DOI: https://doi.org/10.1109/JSEN.2020.3004629

65) 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** 2020, 12(12), 2047, https://doi.org/10.3390/rs12122047

66) P. L. Dovesi, M. Poggi, L. Andraghetti, M. Martí, H. Kjellström, A. Pieropan, S. Mattoccia, "Real-time semantic stereo matching", IEEE/RSJ International Conference on Robotics and Automation (**ICRA 2020**), May 31 - June 4, 2020, Paris, France

67) M. Poggi, F. Tosi, S. Mattoccia, "Learning a confidence measure in the disparity domain from O(1) features", **Computer Vision and Image Understanding**, Volume 193, April 2020

68) F. Aleotti, M. Poggi, F. Tosi, S. Mattoccia, "Learning end-to-end scene flow by distilling single tasks knowledge", accepted at Thirty-Fourth AAAI Conference on Artificial Intelligence (**AAAI-2020**), New York, USA, February 7-12 2020

69) A. Tonioni, M. Poggi, S. Mattoccia, L. Di Stefano, "Unsupervised domain adaptation for depth prediction from images", **IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)**, 42(10), pp 2396 - 2409, October 1, 2020, 10.1109/TPAMI.2019.2940948

70) M. Poggi, G. Agresti, F. Tosi, P. Zanuttigh, S. Mattoccia, "Confidence estimation for ToF and stereo sensors and its application to depth data fusion", **IEEE Sensors Journal**, 20(2), pages 1411-1421, February, 1 2020

71) L. Andraghetti, P. Myriokefalitakis, P. L. Dovesi, B. Luque, M. Poggi, A. Pieropan, S. Mattoccia, "Enhancing self-supervised monocular depth estimation with traditional visual odometry", International Conference on 3D Vision (**3DV 2019**), Quebec City, Canada, September 16-19 2019

72) M. Poggi, D. Pallotti, F. Tosi, S. Mattoccia, "Guided stereo matching", IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR 2019**), Long Beach, CA, USA, June 16-20 2019

73) F. Tosi, F. Aleotti, M. Poggi, S. Mattoccia, "Learning monocular depth estimation infusing traditional stereo knowledge", IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR 2019**), Long Beach, CA, USA, June 16-20 2019

74) A. Tonioni, F. Tosi, M. Poggi, S. Mattoccia, L. Di Stefano, "Real-time self-adaptive deep stereo", **oral presentation** at IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR 2019**), Long Beach, CA, USA, June 16-20 2019

75) F. Tosi, M. Poggi, S. Mattoccia, "Learning to detect and take advantage of reliable anchor points for embedded stereo refinement", 15th IEEE Embedded Vision Workshop (EVW 2019) held in conjunction with CVPR 2019, Long Beach, CA, USA, June 16, 2019

76) V. Peluso, A. Cipolletta, A. Calimera, M. Poggi, F. Tosi, S. Mattoccia, "Enabling energy-efficient unsupervised monocular depth estimation on ARMv7-based platforms", Design Automation and Test in Europe (**DATE 2019**), Florence, Italy, March 25 - 29, 2019

77) M. Poggi, D. Pallotti, F. Tosi, S. Mattoccia, "Depth determination method based on images, and relative system", patent pending

78) C. Arcidiacono, M. Barbari, S. Benni, E. Carfagna, G. Cascone, L. Conti, L. Di Stefano, M. Guarino, L. Leso, D. Lovarelli, M. Mancino, S. Mattoccia, G. Minozzi, S. M. C. Porto, G. Provolo, G. Rossi, A. Sandrucci, A. Tamburini, P. Tassinari, N. Tomasello, D. Torreggiani and F. Valenti, "Smart Dairy Farming: Innovative Solutions to Improve Herd Productivity", International Mid-Term Conference of the Italian Association of Agricultural Engineering, September 12-13, 2019, Matera, Italy

79) P. Zama Ramirez, M. Poggi, F. Tosi, S. Mattoccia, L. Di Stefano, "Geometry meets semantic for semi-supervised monocular depth estimation", 14th Asian Conference on Computer Vision (**ACCV 2018**), December 2-6, 2018, Perth, Australia

80) M. Poggi, F. Aleotti, F. Tosi, S. Mattoccia, "Towards real-time unsupervised monocular depth estimation on CPU", IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS 2018**), Madrid, Spain, October 1-5, 2018

81) F. Tosi, M. Poggi, A. Benincasa, S. Mattoccia, "Beyond local reasoning for stereo confidence estimation with deep learning", 15th European Conference on Computer Vision (**ECCV 2018**), Munich, Germany, September 8-14

82) F. Aleotti, F. Tosi, M. Poggi, S. Mattoccia, "Generative adversarial networks for unsupervised monocular depth prediction", 3D Reconstruction in the Wild 2018 (3DRW2018), in conjunction with (ECCV 2018), Munich, Germany, September 14, 2018

83) M. Poggi, F. Tosi, S. Mattoccia, "Learning monocular depth estimation with unsupervised trinocular assumptions", 6th international conference on 3D Vision (**3DV 2018**), September 5-8, 2018, Verona, Italy

84) P. Di Febbo, C. Dal Mutto, K. Tieu, S. Mattoccia, "KCNN: extremely-efficient hardware keypoint detection with a compact convolutional neural network", 14th IEEE Embedded Vision Workshop (EVW 2018), held in conjunction with CVPR 2018, Salt Lake City, Utah (USA), July 18, 2018 (**BEST PAPER AWARD**)

85) S. Mattoccia, B. Kisačanin, M. Gelautz, S. Chai, A. N. Belbachir, G. Dedeoglu, F. Stein, "Guest Editorial: Special Issue on Embedded Computer Vision", Journal of Signal Processing Systems, June 2018, Volume 90, Issue 6, pp 873–876

86) 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**, 2018, 10(12), 2010

87) M. Poggi, F. Tosi, S. Mattoccia, "Quantitative evaluation of confidence measures in a machine learning world", **spotlight presentation** at IEEE/CVF International Conference on Computer Vision (**ICCV 2017**), October 22-29, 2017, Venice, Italy

88) A. Tonioni, M. Poggi, S. Mattoccia, L. Di Stefano, "Unsupervised adaptation for deep stereo", IEEE/CVF International Conference on Computer Vision (**ICCV 2017**), October 22-29, 2017, Venice, Italy

89) F. Tosi, M. Poggi, A. Tonioni, L. Di Stefano, S. Mattoccia, "Learning confidence measures in the wild", 28th British Machine Vision Conference (**BMVC 2017**), September 4-7, 2017, Imperial College London, UK

90) M. Poggi, F. Tosi, S. Mattoccia, "Efficient confidence measures for embedded stereo", 19th International Conference on Image Analysis and Processing (ICIAP 2017), September 11-15, 2017, Catania, Italy

91) M. Poggi, S. Mattoccia, "Learning to predict stereo reliability enforcing local consistency of confidence maps", IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR 2017**), Honolulu, Hawaii (USA), July 21-26, 2017

92) M. Poggi, F. Tosi, S. Mattoccia, "Even more confident predictions with deep machine-learning", 13th IEEE Embedded Vision Workshop (EVW2017) held in conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR 2017), Honolulu, Hawaii (USA), July 21, 2017

93) M. Poggi, S. Mattoccia, "Evaluation of variants of the SGM algorithm aimed at implementation on embedded or reconfigurable devices", International Conference on 3D Imaging (IC3D), Liège, Belgium, 13-14 December 2016

94) M. Boschini, M. Poggi, S. Mattoccia, "Improving the reliability of a 3D people tracking leveraging on deep-learning", International Conference on 3D Imaging (IC3D), Liège, Belgium, 13-14 December 2016

95) P. Di Febbo, S. Mattoccia, C. Dal Mutto, "Real-time image distortion correction: analysis and evaluation of FPGA-compatible algorithms", 2016 International Conference on Reconfigurable Computing and FPGAs (Reconfig 2016), November 30-December 2, 2016, Cancun, Mexico

96) M. Poggi, S. Mattoccia, "Learning a general-purpose confidence measure based on O(1) features and a smarter aggregation strategy for semi-global matching", **oral presentation** at the 2016 International Conference on 3D Vision (**3DV 2016**), October 25-28, 2016, Stanford University, California, USA

97) M. Poggi, S. Mattoccia, "Deep Stereo Fusion: combining multiple disparity hypotheses with deep-learning", 2016 International Conference on 3D Vision (**3DV 2016**), October 25-28, 2016, Stanford University, California, USA

98) G. Marin, P. Zanuttigh, S. Mattoccia, "Reliable fusion of ToF and stereo depth driven by confidence measures", 14th European Conference on Computer Vision (**ECCV 2016**), October 8-16, 2016, Amsterdam, Netherland

99) M. Poggi, S. Mattoccia, "Learning from scratch a confidence measure", 27th British Machine Vision Conference (**BMVC 2016**), September 19-22, 2016, York, UK

100) M. Poggi, S. Mattoccia, "A wearable mobility aid for the visually Impaired based on embedded 3D vision and deep learning", First IEEE Workshop on ICT Solutions for eHealth (IEEE ICTS4eHealth 2016) in conjunction with the Twenty-First IEEE Symposium on Computers and Communications, June 27-30, 2016, Messina, Italy

PATENTS

1. L. Bartolomei, S. Mattoccia, M. Poggi, F. Tosi, "Virtual Pattern Projection Device", pending
2. M.Poggi, F. Aleotti, Fabio Tosi, S. Mattoccia, V. Peluso, A. Cipolletta, A. Calimera, "Method for determining the depth from a single image and system thereof", pending
3. 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, **Intellectual Property Award**
4. A. Tonioni, M. Poggi, F. Tosi, S. Mattoccia, L. Di Stefano, "Depth determination method based on images, self-adaptive neural networks, and relative system", pending
5. M. Poggi, D. Pallotti, F. Tosi, S. Mattoccia, "Depth determination method based on images, and relative system", pending (Italian patent no. 102019000006964, March 23, 2021)
6. S. Mattoccia, L. Di Stefano, A. Annovi, "Metodo per l'individuazione e la correzione di disallineamenti di una pluralità di immagini componenti concorrenti a formare un'immagine risultante da controllare", MO2007A000032, January 30, 2007
7. S. Mattoccia, L. Di Stefano, "Apparecchio e metodo per il confronto di immagini digitali", IT0001341200, September 25, 2007

AWARDS

- [Intellectual Property Award 2021 for Future mobility](#) at EXPO 2020/22

- Best paper award honorable mention at International Conference on 3D VIsion (3DV 2021)
- Best paper award at 14th IEEE Embedded Vision Workshop (CVPR 2018)
- Best demo paper award at 4th IEEE Workshop on Mobile Vision (CVPR 2014)
- Best paper award at 7th IEEE Embedded Vision Workshop (CVPR 2011)

ACKNOWLEDGMENTS

- Outstanding reviewer, BMVC 2021
- Outstanding reviewer, CVPR 2013

AREA CHAIR

- IEEE/CVF Int. Conf. on Computer Vision and Pattern Recognition 2025 (CVPR 2025)
- 38th Annual Conference on Neural Information Processing Systems (NeurIPS 2024)
- IEEE/CVF Int. Conf. on Computer Vision and Pattern Recognition 2024 (CVPR 2024)
- IEEE/CVF Int. Conf. on Computer Vision and Pattern Recognition 2023 (CVPR 2023)
- IEEE/CVF Int. Conf. on Computer Vision and Pattern Recognition 2022 (CVPR 2022)
- IEEE Int. Conf. on Multimedia & Expo 2014 (ICME 2014)
- IEEE Int. Conf. on Multimedia & Expo 2013 (ICME 2013)

EDITORIAL ACTIVITY

- Member of the editorial board of Pattern Recognition Letters, Elsevier (April 2021 - December 2023)
- Member of the editorial board of The Visual Computer journal, Springer (January 2021 - December 2023)
- Member of the editorial board of Remote Sensing journal, MDPI (February 2020 -)
- Co-Guest editor for International Journal of Computer Vision special issues on "Traditional Computer Vision in the Age of Deep Learning", 2021
- Co-Guest editor for Remote Sensing special issue on "Utilization of Multisensors and Data Fusion in Remote Sensing", 2020
- Lead co-guest editor for Springer's Journal of Signal Processing Systems special issue on "*Embedded computer vision*", 2016
- Co-Guest editor of IEEE Journal of Selected Topics in Signal special issue on "*Emerging techniques in 3D*", (Volume 6, Issue 5), 2012

WORKSHOP ORGANIZATION

- 1st Workshop on "Traditional Computer Vision in the Age of Deep Learning", ICCV 2021
- General co-Chair 12th IEEE Embedded Vision Workshop (EVW2016), CVPR 2016 workshop
- Program Chair 11th IEEE Embedded Vision Workshop (EVW2015), CVPR 2015 workshop
- Program co-Chair 10th IEEE Embedded Vision Workshop (EVW2014), CVPR 2014 workshop

ADVISORY BOARD OF PhD PROGRAM

Member of the Advisory Board of the international and multidisciplinary PhD program in Engineering and Information Technology for Structural and Environmental Monitoring and Risk Management - EIT4SEMM (formerly Structural and Environmental Health Monitoring and Management (SEHM2)): https://phd.unibo.it/eit4semm/en

PhD COMMITTEES

- University of Ferrara, Italy (2024)
- University of Ferrara, Italy (2022)
- AIT Austrian Institute of Technology, Vienna, Austria (2021)
- TU Graz, Austria (2018)
- University of Bologna, Italy (2018)
- Politecnico di Torino, Italy (2018)
- University of Padova, Italy (2017)
- University of Parma, Italy (2015)

JOURNAL REVIEWER and TECHNICAL PROGRAM COMMITTEE MEMBER

I regularly serve as a reviewer for leading international conferences and journals as:

IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Image Processing, IEEE Transactions on Medical Images, IEEE Transactions on Circuits and Systems I, IEEE Transactions on Circuits and Systems - II, IEEE Transactions on Circuits and Systems for Video Technology, IEEE Transactions on VLSI Systems, IEEE Transactions on Neural Systems and Rehabilitation Engineering, IEEE Transactions on Emerging Topics in Computing, IEEE Signal Processing Letter, Computer Vision and Image Understanding, Image and Vision Computing, Machine Vision and Applications, Pattern Recognition Letters, Elsevier Journal of Visual Communication and Image Representation, Journal of Signal Processing Systems, Journal of Microprocessors and Microsystems, Digital Signal Processing, IET Computer Vision, IET Intelligent Transport Systems, VLSI Design, EURASIP Journal on Image and Video Processing, ISRN Machine Vision, SPIE Journal of Electronic Imaging, SPIE Optical Engineering, Optics Express, International Journal of Computational Vision and Robotics, Artificial Intelligence in Medicine, International Journal of Artificial Intelligence and Soft Computing, Artificial Intelligence Review, The Knowledge Engineering Review, Journal of Network and Computer Applications, Computer Animation and Virtual Worlds

RESEARCH SUPERVISION

PhD students

- Enrico Mannocci, University of Bologna (Nov 1st 2023, -), TBD
- Ugo Leone Cavalcanti, University of Bologna (Nov 1st 2023, -), TBD
- Gong Ziren, University of Bologna (Nov 1st 2023, -), TBD
- Luca Bartolomei, University of Bologna (Nov 1st 2022, -), Deep stereo vision, co-supervised
- Alessio Mingozzi, University of Bologna (Nov 1st 2022, -), Optical flow, co-supervised
- Andrea Conti, University of Bologna (Nov 1st 2021, -), "Depth completion", co-supervised
- Huan Li, University of Bologna (Nov 1st 2021, -), "Fast Monocular depth estimation", co-supervised
- Youmin Zhang, University of Bologna (2020, present), "Deep depth estimation", co-supervised
- Fan Rizhao, University of Bologna (2020, present), "Active and passive depth sensing", co-supervised
- Filippo Aleotti, University of Bologna (2018, 2021), "Unsupervised monocular depth estimation"
- Fabio Tosi, University of Bologna (2017-2020), "Deep-learning for 3D reconstruction", Best PhD Thesis Award 2020-2022 - Italian Association for Computer Vision, Pattern Recognition and Machine Learning (CVPL)
- Matteo Poggi, University of Bologna (2014-2017), "Machine learning for stereo vision"

- Leonardo De-Maeztu (2008-2012), "Towards accurate and real-time local stereo correspondence algorithms: computational efficiency and massively parallel architectures", co-supervised, Public University of Navarre (Spain)
- Federico Tombari (2006-2009), "Methodologies for visual correspondence", co-supervised, University of Bologna (Italy)

Internships

- Ninghui Xu (Feb 2025 – Feb 2026) from Southeast University, China
- Xiaohan Li (Oct 2024 – Oct 2025) from Institute of Advanced Technology, University of Science and Technology of China
- Chaoqiang Zhao (Oct 2021 – Nov 2022), from East China University of Science and Technology, Shanghai (China), PhD student
- Xin Qiao (Oct 2021 – Nov 2022), from the Xi'an Jiaotong University (China), PhD student
- Li Zhang (Oct 2019 – Aug 2021), from China Agricultural University (China), PhD student
- Yuan Shen (Sep 2019 – Apr 2020), from Beihang University, Beijing (China), PhD student
- Leonardo De-Maeztu (May 2010 – Aug. 2010), from the Public University of Navarre (Spain), PhD student

Research fellows

- Milo Marchetti, 2022/23
- Andrea Conti, 2021
- Alessio Mingozzi, 2021 - 2022 (18 months)
- Dr. Matteo Poggi, 2016 - 2021
- Alessandro Maragno, 2017-2018
- Marco Casadio, 2012-2014
- Ilario Marchio, 2012-13
- Paolo Macrì 2014
- Davide Nanni, 2010 - 2011

COLLABORATIONS (ongoing)

- Sony Depthsensing Solutions SA/NV (Belgium)
- Univrses AB (Sweden)
- Prof. Philippos Mordohai's Group at Stevens Institute of Technology (USA)
- Prof. Kwanghoon Sohn's Group at Yonsei University (South Korea)
- Prof. Andrea Calimera's Group at the Politecnico di Torino (Italy)
- Prof. Pietro Zannutigh's Group at the University of Padova (Italy)

PROJECTS

- 2022 (4 months) – "Evaluation of stereo vision techniques for lightweight vehicles", funded by E-Novia, Participant
- 2022 (12 months) – "Enhancing a patent application aimed at improving auto-adapting depth from images", funded by Alma Mater University of Bologna, Participant
- 2022 (18 months) – "Machine learning for the fashion industry (Faretra)", funded by MISE, Participant
- 2021 (14 months) – "Multi-modal image registration", funded by Huawei Technologies Oy (Finland), Participant

- 2020 (12 months) – "Enhancing a patent application aimed at improving depth from images", funded by Alma Mater University of Bologna and Ministero per lo Sviluppo Economico (MISE). Participant
- 2020 (18 months) – "Machine learning for visual inspection e quality control", funded by BI-REX Big Data Innovation & Research Excellence, Bologna. Participant
- 2020 (6 months) – Machine learning and computer vision for monitoring social distancing and safety", funded by Regione Emilia Romagna. Participant
- 2019 (36 months) – "Smart dairy farming: innovative solutions to improve herd productivity", PRIN: PROGETTI DI RICERCA DI RILEVANTE INTERESSE NAZIONALE – Bando 2017. Participant
- 2017 (15 months) – "3D vision for safety applications", a research project funded by FAAC. Scientific supervisor
- 2016 (12 months) – "Study, design, and development of a new vision-based measurement system", a research project funded by Snap-On Equipment. Scientific supervisor
- 2013 (12 months) - "Development of a real-time 3D vision sensor and its applications", a research project funded by Regione Emilia Romagna and Confindustria. Scientific supervisor
- 2012 (14 months) - "Development of a real-time 3D camera with USB interface", a research project funded by Brav Srl, Vignola (MO), Italy. Scientific supervisor
- 2011 (4 months) "Evaluation of stereo vision algorithms for automotive applications", a research project funded by IMRA Europe S.A.S, Sophia Antipolis, France. Scientific supervisor
- 2011/2012 (24 months) "Vision for industrial applications", a research project funded by Regione Emilia Romagna in collaboration with Datalogic Group, System Group, T3LAB, CRIT. Participant
- 2011 (1 month) "Characterization of a stereo vision system for logistic applications", research contract with GEPA Srl, Modena (MO), Italy. Scientific supervisor
- 2010 (14 months) - "Stereo vision algorithms suited for FPGAs", research contract with Brav Srl, Vignola (MO). Scientific supervisor
- 2009 (18 months) - "Adaptive control for color printing on ceramic tiles", a research project funded by MIUR (Ministry of Education, University and Research) and System Group, Fiorano (MO). Participant
- 2009 (7 months) – "Computational vision and control process", a project funded by MIUR (Ministry of Education, University and Research) and System Group Fiorano (MO). Participant
- 2009 (6 months) - " Visual quality control algorithms for printing on ceramic tiles", Research contract with System Group, Fiorano (MO), Italy. Participant
- 2008 (4 months) - "Evaluation of stereo matching algorithms", Research contract with Datalogic Automation, Monte San Pietro (BO), Italy. Participant
- 2007/2008 (12 months) - "Computer vision algorithms for augmented reality", Research contract between Polo Didattico Scientifico di Forlì of the University of Bologna, in cooperation with V-Lab Forlì, and CIRA (Centro Italiano Ricerche Aerospaziali) Capua (CE), Italy. Participant
- 2007 (12 months) - "People counting methodologies for visual surveillance applications", research contract with PLEXA Srl Pianoro (BO), Italy. Participant
- 2006 (3 months) - "Development of computer vision algorithms for automatic quality inspection of ceramic tiles", research contract with System Group, Fiorano (MO), Italy. Participant
- 2005 (4 months) - "Evaluation of computer vision techniques for visual inspection of ceramic tiles", research contract with System Group, Fiorano (MO), Italy. Participant
- 2005 (24 months) - "Development of computer vision techniques for safety applications", a research project funded by Regione Emilia Romagna and Datalogic Automation, Monte San Pietro (BO), Italy. Participant

- 2001 (12 months) - "Stereo vision for visual surveillance applications" research project funded by the University of Bologna. PI
- 2001 (60 months) - "Real-time Analysis of Video Sequences", a research project funded by MIUR (Ministry of Education, University and Research). Participant
- 1999 (6 months) - "Real-time template matching algorithms suited for automatic alignment of electronic devices", research contract with AUREL SpA, Modigliana (FC), Italy. Participant
- 1998 (24 months) - "Methodologies and applications of real-time computer vision", a research project funded by MIUR (Ministry of Education, University and Research). Participant
- 1996 (36 months) - "Advanced systems for visually impaired", a research project funded by the University of Bologna. Participant (in 1998)

PROFESSIONAL SOCIETIES MEMBERSHIP

- IEEE and the IEEE Computer Society, 2006 – present, Senior Member since December 2022
- CVPL (Italian Association for Computer Vision, Pattern Recognition and Machine Learning, the Italian chapter of IAPR), 2006 – present
- Key Member 2012-2014 of the Interest Group on 3D Rendering, Processing, and Communications of IEEE MMTC (Multimedia Technical Committee) of IEEE Communications Society

TEACHING

- Digital systems
- Computer architectures
- Logic design principles
- Foundations of computer programming