



Niccolò Bisagno

Date of birth: 21/11/1992 | **Nationality:** Italian | **Gender:** Male | **Phone number:** (+39) 3495239965 (Mobile) | **Email address:** niccolo.bisagno@unitn.it |

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Via Sommarive , 9, 38123, Povo, Italy (Work)

WORK EXPERIENCE

01/02/2023 – CURRENT Trento, Italy

ASSISTANT PROFESSOR (RTD-A) UNIVERSITY OF TRENTO

1. Project Manager for the PNRR-funded **iNest** project (€4.2M).
2. Leading a research team with PhD students, research collaborators, and international partners.
3. Published **oral papers** in top Computer Vision conferences (**CVPR, ICCV**).
4. Developing **deep learning-based solutions** for sports analysis in Python in collaboration with external organizations.
5. Teaching **Segnali, Visione e Riconoscimento** (Bachelor) and **Computer Vision** (Master) courses.

31/12/2016 – 01/02/2018 Trento, Italy

CONSULTANT OF CIVIL ENGINEERING DEPARTMENT UNIVERSITY OF TRENTO

- Participated to an interdisciplinary project with the Department of Civil Engineering.
- Developed a tracking and analysis software for avalanche flow analysis using Python and OpenCV.
- Responsible for experiment design, hardware evaluation and setup.

14/06/2020 – 31/01/2023

COMPUTER VISION RESEARCHER - POSTDOC UNIVERSITY OF TRENTO

1. Leading team research with PhD students, research collaborators and internationals.
2. Published papers accepted as Orals in main Computer Vision conferences (CVPR, ICCV) .
3. Developing solutions with external organizations for sports analysis using deep learning techniques in Python.

01/03/2019 – 31/07/2019 Orlando, United States

VISITING RESEARCHER UNIVERSITY OF CENTRAL FLORIDA (UCF)

- Visiting Researcher advised by Prof. Mubarak Shah.
- Working on out-of-distribution (OOD) detection.

01/03/2018 – 04/2018 Klagenfurt, Austria

VISITING RESEARCHER ALPEN-ADRIA-UNIVERSITÄT KLAGENFURT

- Visiting Researcher advised by Prof. Bernhard Rinner.
- Working on distributed camera systems.

31/12/2016 – 31/10/2018 Trento, Italy

COLLABORATOR OF THE IT DEPARTMENT UNIVERSITY OF TRENTO

- Development of a collaboration platform for IT managers of italian universities (CODAU).
- Testing and diffusion of Google Suite new tools for collaboration.
- Creation of surveys and analysis of the results.

31/08/2017 – 31/08/2020

TEACHING ASSISTANT FOR THE COMPUTER VISION COURSE UNIVERSITY OF TRENTO

- Teaching lab sessions on Computer Vision to 50-70 students from different backgrounds.
- Renewing and updating course material to stay up to date (e.g. CNNs, transition from C++ to Python).

- Mentoring and tutoring students during projects and thesis.
- Evaluating students during oral exams and projects.

31/03/2018 – 30/12/2018 Trento, Italy

COMPUTER VISION ENGINEER XTENSA

- Developing of a software solution for several professional football teams (Serie A).
- Engineering and optimization of a real-time stitching software of 4K views on a notebook using C++, OpenCV, GPU, and Cuda.
- On field testing and deployment, user training, on-field and remote customer assistance.

EDUCATION AND TRAINING

31/10/2016 – 14/04/2020 Trento, Italy

PHD IN INFORMATION AND COMMUNICATION TECHNOLOGIES University of Trento

- Thesis "On modeling and analysing crowds from videos"
- Deep Learning classification for Open Set datasets.
- Programming (C++, C#, Python)
- Image processing (Matlab, OpenCV)
- 3D Game Design and Development (Unity3D)

Level in EQF EQF level 8

14/09/2014 – 25/10/2016 Trento, Italy

MASTER DEGREE IN TELECOMMUNICATION ENGINEERING University of Trento

- Thesis on synthetic crowd simulation for motion analysis and path prediction
- Computer Vision (crowd analysis, tracking, camera pose estimation)
- Distributed systems theory and design (Wireless Sensor Networks)
- Antenna arrays analysis

Level in EQF EQF level 7

14/09/2011 – 14/09/2014 Trento, Italy

BACHELOR DEGREE IN ELECTRONIC AND TELECOMMUNICATIONS ENGINEERING Università di Trento

Thesis on testing a non linear solver for Compressive Sensing problems

Level in EQF EQF level 6

LICENSED IN INFORMATION ENGINEERING Ordine degli Ingegneri della provincia di Trento

LANGUAGE SKILLS

Mother tongue(s): **ITALIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C2	C2	C2	C2	C2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

List of Publications

1. Articles:

2024

Sambugaro, Z.; Garau, N.; **Bisagno, N.**, Conci, N.. "Agglomerator++: Interpretable part-whole hierarchies and latent space representations in neural networks." Computer Vision and Image Understanding, 2024.

- Available at: <https://doi.org/10.1016/j.cviu.2024.104159>

Martinelli G.; Garau, N.; **Bisagno, N.**, Conci, N.. "MoMa: Skinned Motion Retargeting Using Masked Pose Modeling" Computer Vision and Image Understanding, 2024.

- Available at: <https://doi.org/10.1016/j.cviu.2024.104141>

2021

Bisagno, N., Saltori, Cristiano; Zhang, Bo; De Natale, Francesco G. B.; Conci, Nicola. "Embedding group and obstacle information in LSTM networks for human trajectory prediction in crowded scenes." Computer Vision and Image Understanding, 2021.

- Available at: <https://doi.org/10.1016/j.cviu.2020.103126>

Zhang, Bo; Zhang, R.; **Bisagno, N.**; Conci, N.; De Natale, F.; Liu, H.. "Where Are They Going? Predicting Human Behaviors in Crowded Scenes." ACM Transactions on Multimedia Computing, Communications and Applications, 2021.

- Available at: <https://doi.org/10.1145/3449359>

2020

Bisagno, N.; Xamin, A.; De Natale, F.; Conci, N.; Rinner, B. "Dynamic camera reconfiguration with reinforcement learning and stochastic methods for crowd surveillance." Sensors, 2020.

- Available at: <https://doi.org/10.3390/s20174691>

2. Conference Papers:

2024

Garau, N.; Martinelli G.; **Bisagno, N.**; Tomè D.; Stoll C.. "EPOCH: Jointly Estimating the 3D Pose of Cameras and Humans" Proceedings of the European conference on computer vision (ECCV) workshops, 2024.

- Available at: accepted, waiting for publication

Martinelli G.; Garau, N.; **Bisagno, N.**; Conci N.. "Skeleton-Aware Motion Retargeting Using Masked Pose Modeling" Proceedings of the European conference on computer vision (ECCV) workshops, 2024.

- Available at: accepted, waiting for publication

Bisagno, N.; Garau, N.; Stefani, AL; Conci, N.. "UniCrowd Simulator: Visual and Behavioral Fidelity for the Generation of Crowd Datasets" IEEE ICIP, 2024.

- Available at: accepted, waiting for publication

Martinelli G.; Garau, N.; **Bisagno, N.**, Conci, N.. "All Skeletons are created equal! A domain adaptation transformer to handle multiple topologies" IEEE ICIP, 2024.

- Available at: accepted, waiting for publication

Martinelli G.; Diprima, F.; **Bisagno, N.**; Conci, N.. "Ski Pose Estimation". IEEE STAR 2024 Proceedings, 2024.

- Available at: <https://doi.org/10.1109/STAR62027.2024.10635966>

Stefani, AL; **Bisagno, N.**; Conci, N.. "MapFlow: Multi-Agent Pedestrian Trajectory Prediction Using Normalizing Flow". 2024 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2024.

- Available at: <https://doi.org/10.1109/ICASSP48485.2024.10448062>

2023

Orlandi, L.; Martinelli, G.; Laiti, F.; Lobba, D.; **Bisagno, N.**; Conci, N. "Meta-Trainer: An Augmented Reality Trainer for Home Fitness with Real-Time Feedback." IEEE STAR 2023 Proceedings, 2023.

- Available at: <https://doi.org/10.1109/STAR58331.2023.10302670>

Aliprandi, P.; Girardi, L.; Martinelli, G.; De Natale, F.; **Bisagno, N.**; Conci, N. "A Case Study for the Automatic Supervision of Body-Weight Exercises: The Squat." IEEE STAR 2023 Proceedings, 2023.

- Available at: <https://doi.org/10.1109/STAR58331.2023.10302651>

2022

Conci, N.; De Natale, F. G. B.; Dalponte, M.; Bernabe, S.; **Bisagno, N.** "Accessible Video Analytics: the Use Case of Basketball." 2022 IEEE International Workshop on Sport, Technology and Research, STAR 2022 - Proceedings, 2022.

- Available at: <https://doi.org/10.1109/STAR53492.2022.9859710>

Garau, N.; **Bisagno, N.**; Sambugaro, Z.; Conci, N. "Interpretable part-whole hierarchies and conceptual-semantic relationships in neural networks." (ORAL) Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), 2022.

- Available at: <https://doi.org/10.1109/CVPR52688.2022.01332>

2021

Song, Yue; **Bisagno, N.**; Hassan, SZ; Conci, N. "AG-GAN: An Attentive Group-Aware GAN for pedestrian trajectory prediction." 2020 25th International Conference on Pattern Recognition (ICPR), 2021.

- Available at: <https://doi.org/10.1109/ICPR48806.2021.9413077>

Garau, N.; Martinelli, G.; Brodka, P.; **Bisagno, N.**; Conci, N. "PanopTOP: A framework for generating viewpoint-invariant human pose estimation datasets." Proceedings of the IEEE International Conference on Computer Vision (ICCV), 2021.

- Available at: <https://doi.org/10.1109/ICCVW54120.2021.00031>

Zaeemzadeh, A.; **Bisagno, N.**; Sambugaro, Z.; Conci, N.; Rahnavard, N.; Shah, M. "Out-of-Distribution Detection Using Union of 1-Dimensional Subspaces." Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), 2021.

- Available at: <https://doi.org/10.1109/CVPR46437.2021.00933>

Garau, N.; **Bisagno, N.**; Brodka, P.; Conci, N.. "DECA: Deep viewpoint-Equivariant human pose estimation using Capsule Autoencoders." 2021 IEEE/CVF International Conference on Computer Vision (ICCV), 2021.

- Available at: <https://doi.org/10.1109/ICCV48922.2021.01147>

2019

Bisagno N.; Garau N.; Montagner A.; Conci N. "Virtual crowds: An LSTM-based framework for crowd simulation" International Conference on Image Analysis and Processing (ICIAP), 2019

- Available at: https://doi.org/10.1007/978-3-030-30642-7_11

2018

Bisagno, N.; Conci, N.; Rinner, B. "Dynamic camera network reconfiguration for crowd surveillance." Proceedings of the 12th International Conference on Distributed Smart Cameras (ICDSC), 2018.

- Available at: <https://doi.org/10.1145/3243394.3243704>

Bisagno, N.; Conci, N.. "Virtual camera modeling for multi-view simulation of surveillance scenes" 26th European Signal Processing Conference (EUSIPCO), 2018.

- Available at: <https://doi.org/10.23919/EUSIPCO.2018.8553409>

Bisagno, N.; Zhang, B.; Conci, N. "Group LSTM: group trajectory prediction in crowded scenarios." Proceedings of the European conference on computer vision (ECCV) workshops, 2018.

- Available at: https://doi.org/10.1007/978-3-030-11015-4_18

3. Ph.D. Thesis:

Bisagno, Niccolò. "On simulating and predicting pedestrian trajectories in a crowd." Università degli studi di Trento, 2020.

- Available at: https://doi.org/10.15168/11572_256722

4. In Book:

Conci, Nicola; Bisagno, Niccolò; Cavallaro, Andrea. "On Modeling and Analyzing Crowds From Videos." Computer Vision For Assistive Healthcare, 2018.

- Available at: <https://doi.org/10.1016/B978-0-12-813445-0.00011-3>

5. Pre-print:

Bisagno, N.; Garau, N.; Stefani, AL; Conci, N. "Signal Processing for Haptic Surface Modeling: A Review", SSRN, 2024.

- Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4949861

Bisagno, N.; Garau, Nicola; Stefani, Antonio Luigi; Conci, Nicola. "A Unified Simulation Framework for Visual and Behavioral Fidelity in Crowd Analysis." arXiv, 2023.

- Available at: <https://arxiv.org/abs/2312.02613>

Research Projects

Principal Investigator for the project "**Virtual Touch for Rehab: Enhancing Tactile Realism in Immersive Reality for Innovative Remote Rehabilitation Devices**," awarded through the Young Researcher Grant within the research program of the Innovation Ecosystem "I-NEST – INTERCONNECTED NORD-EST INNOVATION ECOSYSTEM". The project is funded with a budget of €70,000 and spans a duration of 12 months (September 2024–September 2025).

Invited Talks and Tutorials

N. Bisagno and N. Conci, "Synthetic Data and Multimedia", ACM Multimedia Asia, Tokyo (Japan), 2022.

N. Bisagno and N. Conci, "Synthetic Data and Multimedia", IEEE ICIP, Kuala Lumpur (Malaysia) 2023.

Awards

Best demo Award. Co-recipient of the best demo award at the national GTTI-MMSP workshop 2020, Sappada (Italy) with the demo "Real-time stitching and Tactical Camera", by Niccolò Bisagno, Nicola Garau, Andrea Montagner, and Nicola Conci

Best demo Award. Co-recipient of the best demo award at the national GTTI-MMSP workshop 2018, Cavalese (Italy) with the demo "Synthetic crowd simulation", by Niccolò Bisagno, Nicola Garau, Andrea Montagner, and Nicola Conci

Best research poster/demo Award. Recipient of the best demo award at the ICT Days 2017, Trento (Italy), with the demo "Synthetic crowd simulation", by Niccolò Bisagno

Travel Grant Winner as "Best Young Researcher" to attend the Workshop "Anticipating Human Behavior" at the European Conference on Computer Vision (ECCV), Munich, 2018.

Memberships

- Member of IEEE
- Member of the IEEE Signal Processing Society
- Member of CNIT, National Consortium of Telecommunications (www.cnit.it)
- Member of CVPL, Italian Association for Computer Vision, Pattern Recognition and Machine Learning, IAPR branch (www.cvpl.it)

Further Professional Experiences

Member of the evaluation committee for the 2023/24 "Bandi a Cascata" program in the Triveneto area (Budget: €2,000,000) and the Mezzogiorno area (Budget: €1,175,000), responsible for selecting project proposals within the research program of the Innovation Ecosystem "I-NEST – INTERCONNECTED NORD-EST INNOVATION ECOSYSTEM."

Italian professional qualification for the Engineering Order, specializing in the field of Information Engineering, 2017.

Member of the evaluation commission for the Italian professional qualification in the Engineering Order, specializing in Information Engineering, 2024.

A handwritten signature in black ink, appearing to read "Michele J. ...", written in a cursive style.