

# Francesco Tonini

ELLIS PH.D. STUDENT · UNIVERSITY OF TRENTO, ITALY

via alla Formigheta 52, Trento (TN), Italy

☎ (+39) 3468019245 | ✉ francesco@tonini.dev | 🏠 tonini.dev | 📄 francescotonini | 🎓 Francesco Tonini

I am an ELLIS Ph.D. candidate in Artificial Intelligence at the University of Trento, Italy, working on vision-language models for human behavior understanding. My research focuses on **Gaze Following** and **Human-Object Interaction**, with publications featured in top-tier venues such as ICCV and ACM Multimedia. During my Ph.D. studies, I contributed to the SPRING European project, where I was involved in the development and integration of software modules for socially assistive robots for gerontological healthcare.

## Education

### ELLIS Ph.D. in Artificial Intelligence

Trento, Italy

UNIVERSITY OF TRENTO

Sep. 2022 - Current

- Supervisors: Prof. Elisa Ricci (University of Trento, Fondazione Bruno Kessler) and Prof. Cigdem Beyan (University of Verona).

### M.Sc. in Computer Science

Trento, Italy

UNIVERSITY OF TRENTO

Sep. 2019 - Mar. 2022

- Final mark: 110/110 with honors.
- Relevant coursework: Machine Learning, Deep Learning, Foundations of Image and Video Processing, Computer Vision, Simulation and Performance Evaluation, Data Mining, Data Visualization, Computability and Computational Complexity, Distributed Systems, and Advanced Computing Architectures.

### B.Sc. in Computer Science

Verona, Italy

UNIVERSITY OF VERONA

Sep. 2016 - Jul. 2019

- Final mark: 102/110.
- Relevant coursework: Fundamentals of Image and Video Processing, Computer Graphics, Algorithms, Software Engineering, Computer Networks, C and Java programming, Operating System basics, Logic, Probability and Statistics, Mathematical Analysis, and Physics.

## Experience

### University of Trento

Trento, Italy

TEACHING ASSISTANT, DEEP LEARNING COURSE

Feb. 2024 - Sep. 2024

- Taught students how to build, train, and fine-tune popular neural networks, including CNNs, RNNs, and Transformers, using PyTorch.
- Supervised and guided master's students throughout their course projects.

### SPRING Project (EU Horizon 2020)

Trento, Italy

JUNIOR RESEARCHER

Sep. 2022 - Jun. 2024

- Deployed software modules developed by the University of Trento, including our gaze target detection model presented at ICCV 2023, to enhance human behavior understanding.
- Integrated and implemented robotic modules, such as autonomous navigation, speech recognition, and visual perception, in collaboration with project partners.

### Fondazione Bruno Kessler

Trento, Italy

JUNIOR RESEARCHER

Mar. 2022 - Sep. 2022

- Conducted research and developed algorithms for multi-person behavior analysis in crowded environments, addressing challenges such as occlusion, dynamic backgrounds, and complex crowd dynamics.

### University of Trento

Trento, Italy

M.Sc. INTERNSHIP

Sep. 2019 - Mar. 2022

- Conducted a comprehensive analysis of state-of-the-art research in Visual Focus of Attention.
- Developed a deep learning model for Visual Focus of Attention, addressing challenges in human-like attention modeling and improving performance on benchmark datasets.

### University of Verona

Verona, Italy

B.Sc. INTERNSHIP

Mar. 2019 - Jul. 2019

- Designed and implemented a step detection model for smartphones using accelerometer and gyroscope data, enhancing detection accuracy across diverse walking conditions.
- Collected and curated a novel dataset of sensor data for step detection, ensuring comprehensive coverage of various walking patterns and environments.
- Optimized an indoor localization application by integrating and fine-tuning the step detection model.

## Publications

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### AL-GTD: Deep Active Learning for Gaze Target Detection

**F. TONINI**, N. DALL'ASEN, L. VAQUERO, C. BEYAN, E. RICCI  
ACM International Conference on Multimedia (ACMMM)

Melbourne, Australia

Oct. 2024

### Object-aware Gaze Target Detection

**F. TONINI**, N. DALL'ASEN, C. BEYAN, E. RICCI  
International Conference on Computer Vision (ICCV)

Paris, France

Oct. 2023

### Multimodal Across Domains Gaze Target Detection

**F. TONINI**, C. BEYAN, E. RICCI  
ACM International Conference on Multimodal Interaction (ICMI)

Bangalore, India

Nov. 2022

### Socially Pertinent Robots in Gerontological Healthcare

**THE SPRING TEAM**  
International Journal of Social Robotics

Under review

## Academic Activities

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### Summer school

ELLIS SUMMER SCHOOL ON LARGE-SCALE AI FOR RESEARCH AND INDUSTRY

Modena, Italy

Oct. 2023

- Held at the University of Modena and Reggio Emilia.
- Best project award for the development of "Adaptive Patch Selector for Faster Language-Image Pre-training".

### Reviewer

- Computer Vision and Pattern Recognition (2024).
- European Conference on Computer Vision (2024).
- British Machine Vision Conference (2023, 2024).
- IEEE International Conference on Robotics and Automation (2025).
- IEEE Transactions on Industrial Informatics (2024).
- ACM Transactions on Multimedia Computing Communications and Applications (2023, 2024).

### Students supervision

- Supervised three M.Sc. students on hyper-graph human-object interaction, open-vocabulary gaze target detection, and action recognition, respectively.
- Supervised one B.Sc. student on skeleton-based action recognition.

## Awards

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2024 **ACMMM 2024 Travel Stipend**, ACM Special Interest Group on Multimedia (SIGMM)

2022 **Master Thesis Award**, Associazione Italiana per la ricerca in Computer Vision (CVPL)

## Skills

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**Languages** Python, Javascript, C

**Frameworks** Pytorch, Pytorch Lightning, Node.js

**Database** MySQL, PostgreSQL