Francesco Vigni, Ph.D.

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Education

University of Naples Federico II — Naples, Italy
PhD in Information and Communication Technology for Health (ICTH) — *Dec 2021 – Feb 2025*
Final grade: Excellent; Affiliated with ICAROS; Additional label: Doctor Europeaus

University of Siena — Siena, Italy
M.Sc. Computer and Automation Engineering ***Cum Laude*** — *Oct 2015 – Oct 2018*
B.Sc. Management Engineering — *Sep 2011 – Oct 2015*

Research Experience

Research Fellow — Naples, Italy
University of Naples Federico II - EU H2020 MSCA project PERSEO — *Dec 2021 – Feb 2025*
- Defined spontaneous interactions for Human-Robot Interactions (HRI)
- Investigated modular engagement metrics for HRI
- Supervised bachelor and master students

Visiting Researcher — Vienna, Austria
Vienna University of Technology (TUW) — *Oct 2023 – Feb 2024*
- Developed and conducted user studies for spontaneous HRIs
- Implemented autonomous bartending manipulation on a dual-arm service robot

Visiting Researcher — Eindhoven, The Netherlands
Noosware BV — *Jun 2023 – Aug 2023*
- Developed and conducted studies with Turtlebot4
- Investigated users' emotional response of various robot path planning strategies

Research and Teaching Assistant — Munich, Germany
Technical University of Munich — *Apr 2019 – Apr 2020*
- Investigated robotic hand designs, motion and control capabilities for achieving human like hands.
- Developed and carried out tutorials and lecture material for the Bachelor Course "Fundamentals of Human-Centered Robotics"

Intern — Zurich, Switzerland
Disney Research Zurich — *Sep 2018*
- Designed, implemented and tested force controllers for Human-Robot Handshake with particular focus on the mutual exchange of force during the interaction.

Work Experience

Robotic Engineer — Munich, Germany
Roboception GmbH — *May 2021 – Nov 2021*
- Designed and implemented core components of novel in-house products (ROS, C++, Python)
- Improved grasping strategies for backend component *rc_reason*

Autonomous system developer — Munich, Germany
Sttech GmbH — *Apr 2020 – May 2021*
- Tailored motion planning solutions for non-holonomic mobile robots (ROS, C++, Python, Rviz, bullet)
- Developed PoC for autonomous vehicles driving in unstructured scenarios (ROS, Carla simulator)
- Developed embedded vision system prototype capable of real-time object detection and classification (Jetson nano, yolo)

Technical Consultant — Mid-North Italy
Contractor — *Jan 2018 – Apr 2018*
- Trained sales and technical personnel of various Daimler's dealers on novel cloud services onboard vehicles
- Trained on vehicles ICT and their potentials for end-users

Awards & Achievements

Best Paper Award in HRI (Finalist) Our work got nominated finalist for the award on Best HRI during ICRA 2019 Montreal, Canada

Merit grant: awarded for best Master Thesis by the financial institute La BCC ravennate, forlivese e imolese Soc. coop

Merit grant: awarded for research in Human-Robot Interaction - Human-Robot handshake University of Siena - EU grant no. 645599

Merit grant: awarded for abroad exchange semester University of Siena - Technical University of Munich

Projects

PErsonalized Robotics as SErvice Oriented applications - PERSEO | *link*

- Contributed to the definition of personalized social cues for robots as information-providing interfaces
- Member of the project's supervisory board as the students' representative

Centers of Excellence Network for Trustworthy Robotics and Intelligent Systems - CENTRIS | *link*
Center for Tactile Internet with Human-in-the-Loop - CETI | *link*
SOft MAnipulation - SOMA | *link*

Skills

Programming: Python, C, C++, MATLAB, LaTeX, JavaScript, MySQL, Bash, R

Data Analysis & Machine Learning: Statistical Modeling, Bayesian Inference, Supervised and Unsupervised Learning, Feature Engineering, Data Preprocessing, Time Series Analysis, Optimization

Human-Robot Interaction (HRI): Experimental Design, User Studies, Social Robotics, Non-verbal Human-Robot Communication, Interaction Modeling, Likert-scale Analysis, Engagement Metrics

Technologies & Tools: Docker, ROS, Colab, Git, CI/CD, Simulink, Scikit-learn, TensorFlow, Pytorch, OpenCV, Pandas, NumPy, SciPy, Matplotlib, Seaborn, Plotly

Languages: Italian (Native), Spanish (Native), English (Professional), German (Conversational)

Academic Activities

Served as reviewer for: RAL, IROS, ICRA, IJSR, HAI, ISRR, ROMAN

Co-organised: WARN@RoMAN2023, WARN@RoMAN2024

Coursework: Fundamentals of Human-Robot Interaction @ TUM 2019/2020

Organizations

Registered Information Engineer *Feb 2025 – Present*
Order of the Engineers of Forlì (Forlì-Cesena), Section A

Member of IEEE *Dec 2019 – Present*
Institute of Electrical and Electronics Engineers

Executive Director in real estate SME *Dec 2020 – Dec 2023*
Edilrevi srl - trading and leasing real estate

Radio speaker and web developer *Set 2013 – May 2018*
Webradio of University of Siena uRadio

Selected publications

Vigni, Francesco, et al. "The role of closed-loop hand control in handshaking interactions." IEEE Robotics and Automation Letters 4.2 (2019): 878-885

Vigni, Francesco, et al. "Sweet Robot O'Mine - How a Cheerful Robot Boosts Users' Performance in a Game Scenario" 2023 32nd IEEE International Conference on Robot and Human Interactive Communication (RO-MAN). IEEE, 2023

Vigni, Francesco, et al. "A Rosbag Tool to Improve Dataset Reliability." HRI'24: Companion of the 2024 ACM/IEEE International Conference on Human-Robot Interaction. USA, 2024.

Vigni, Francesco, and Silvia Rossi. "Exploring Non-verbal Strategies for Initiating an HRI." International Conference on Social Robotics. Cham: Springer Nature Switzerland, 2022