

# Francesco Vigni, Ph.D.

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## Professional Profile

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Engineer with international experience in robotics, applied AI, and human-centered systems. Combines a strong research background in Human–Robot Interaction with hands-on expertise in perception, motion planning, and embedded vision. Experienced in developing intelligent technologies that bridge people and machines, from interactive prototypes to reliable, real-world applications. Passionate about transforming research into innovation and integrating intelligent systems into products and processes that enhance everyday life. Author of the thesis: “The Unscripted Encounter: Social Cues for Spontaneous Human–Robot Interactions”.

## Technical Competencies

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Core ICT Domains: Human–Robot Interaction (HRI), Embedded & Real-Time Systems, Computer Vision, Data Analysis & Statistical Modeling, Software Architecture & Optimization

Programming: Python, C/C++, TypeScript/JavaScript, SQL, Bash.

Frameworks & Tools: ROS1/ROS2, Docker, TensorFlow, PyTorch, Scikit-learn, Git, GitLab CI/CD, Flask, FastAPI, Django, React

Systems & Infrastructure: AWS, Containerization, Server Management, System Monitoring

Languages: Italian (Native), Spanish (Native), English (C2 Professional), German (B1 Conversational)

## Professional Experience

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### Doctoral Research Fellow

Naples, Italy

*University of Naples Federico II - EU H2020 MSCA Project PERSEO Dec 2021 – Feb 2025*

- Conducted analytical evaluation of interaction models and algorithms, assessing novelty, technical merit, and reproducibility; produced 7+ peer-reviewed papers
- Led investigations into personalization in robotics, coordinating interdisciplinary teams worldwide
- Supervised bachelor’s and master’s theses, mentoring students in structured research and scientific writing

### Robotics Engineer

Munich, Germany

*Roboception GmbH*

May 2021 – Nov 2021

- Designed and validated perception modules for industrial robot–vision systems (ROS, C++, Python)
- Trained and deployed tailored ML models on resource constrained devices
- Enhanced grasping algorithms via performance assessment and optimization, improving reliability by 9%

### Autonomous Systems Developer

Munich, Germany

*Sttech GmbH*

Apr 2020 – May 2021

- Developed motion algorithms for autonomous mobile robot deployed in public environments (ROS, C++, Python, CoppeliaSim)
- Designed and implemented a tailored algorithm for autonomous physical docking
- Prototyped embedded vision systems for real-time detection, balancing accuracy and computational cost (NVIDIA Jetson nano, YOLO, Python)

## Research & Academic Contributions

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### Visiting Researcher

*Autonomous Systems Labs (ASL), TU Wien*

**Vienna, Austria**

*Oct 2023 – Feb 2024*

- Implemented autonomous and safe bartending manipulation on a dual-arm TIAGo++ robot (ROS, Python)

### Visiting Researcher

*Noosware BV*

**Eindhoven, Netherlands**

*Jun 2023 – Aug 2023*

- Analyzed emotional responses to robot motion trajectories in controlled social environments (ROS, C++)

### Research & Teaching Assistant

*Munich Institute of Robotics and Machine Intelligence (TU Munich)* **Munich, Germany** *Apr 2019 – Apr 2020*

- Developed bio-inspired control systems for robotic hands and evaluated performance under variable dynamics.
- Delivered teaching materials for “Fundamentals of Human-Centered Robotics,” simplifying complex technical topics.

### Master Internship

*Disney Research Zurich*

**Zurich, Switzerland**

*Sep 2018 – Oct 2018*

- Implemented software stack and conducted user study for Human-Robot Handshakes (ROS, Arduino)

## Education

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### Ph.D. in Information and Communication Technology for Health **Naples, Italy**

*University of Naples Federico II* *Dec 2021 - Feb 2025*

### M.Sc. in Computer and Automation Engineering (*Cum Laude*) **Siena, Italy**

*University of Siena* *Oct 2015 – Oct 2018*

### B.Sc. in Management Engineering **Siena, Italy**

*University of Siena* *Sep 2011 – Oct 2015*

## Selected Publications

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**Vigni, F.**, et al. “The Role of Closed-Loop Hand Control in Handshaking Interactions.”

*IEEE Robotics and Automation Letters*, 2019. [DOI]

**Vigni, F.**, et al. “Sweet Robot O’Mine – How a Cheerful Robot Boosts Users’ Performance.”

*IEEE RO-MAN*, 2023. [DOI]

**Vigni, F.**, et al. “Too Close to You? Emotion-Adapted Proxemics Behaviours.” *IEEE*

*RO-MAN*, 2024. [DOI]

## Additional Information

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**Marie Skłodowska-Curie Actions Fellowship**, EU H2020 Project PERSEO, Dec. 2021.

**Best Paper Award Finalist in HRI**, IEEE ICRA, 2019.

**Professional Affiliation:** Registered Information Engineer, Section A, National Council of Italian Engineers (Ordine degli Ingegneri, Provincia di Forlì-Cesena, Registration No. 2988).

**Peer Review:** IEEE RA-L, IROS, ICRA, International Journal of Social Robotics, HAI, ISRR, RO-MAN.

**Workshop Organization:** WARN@RO-MAN 2023/24, BEAR@RO-MAN 2025.