

Luigi Biagiotti

Associate Professor in Automatic Control (ING-INF/04)

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Luigi Biagiotti was born in Ravenna, Italy, in 1975. He received his MSc degree in Electronic Engineering (Automatic Control track, 100/100 cum laude) from the University of Bologna in 2000, with a thesis on the control of a robotic gripper for space applications, and his PhD in Automatic Control and Operations Research in 2003, with a thesis titled "Advanced Robotic Hands: Design and Control Aspects." In 2001–2002 he spent six months at the Institute of Robotics and Mechatronics of the German Aerospace Center (DLR), working on Cartesian impedance control for the DLR-Hand II dexterous robotic hand. From 2003 to 2008 he was a postdoctoral researcher at the University of Bologna, focusing on the design, modelling and control of dexterous robotic hands with simplified endoskeletal structures, tendon-driven actuation and viscoelastic skin. From September 2008 to December 2020 he was Assistant Professor in Automatic Control at the University of Modena and Reggio Emilia. Since January 2021 he has been Associate Professor at the Department of Engineering "Enzo Ferrari," where he teaches Automatic Control for the MSc programmes in Mechanical Engineering and Vehicle Engineering, and Smart Robotics for the MSc programme in Artificial Intelligence Engineering.

Researcher unique identifier

- ORCID iD: 0000-0002-2343-6929
- SCOPUS ID: 55970522500

URL for website

- <https://unimore.unifind.cineca.it/resource/person/67865>

Research Areas

- Automatic control, robotics, mechatronics, motion planning and trajectory generation for robots and automatic machines.
- Physical human-robot interaction, shared autonomy, robot programming by demonstration, skill transfer and virtual fixtures.
- Dexterous robotic hands and end-effectors; compliant interaction; impedance/admittance control.
- B-spline and dynamic-filter motion generation; vibration suppression; sloshing-free robotic manipulation; repetitive/iterative control.
- Rehabilitation/social robotics and AI/LLM-enabled multimodal robot interfaces.
- Cooperative manipulation of deformable, flexible and underconstrained objects.

Current and Previous Positions

- 2021–present: Associate Professor in Automatic Control (ING-INF/04), University of Modena and Reggio Emilia.
- 2008–2020: Assistant Professor (Ricercatore) in Automatic Control, University of Modena and Reggio Emilia.
- 2005–2008: Research Fellow, LARER Laboratory, on highly interactive robotic systems and new-concept robotic hands.
- 2003–2005: Postdoctoral Research Fellow, University of Bologna, on control of advanced robotic hands.
- 2003: PhD in Automatic Control and Operations Research, University of Bologna; thesis: "Advanced Robotic Hands: Design and Control Aspects."
- 2000: MSc in Electronic Engineering, Automatic Control track, University of Bologna, 100/100 cum laude.
- 2001–2002: Visiting Researcher, German Aerospace Center (DLR), Institute of Robotics and Mechatronics, Germany.

Prizes and Awards

- 2019: Best Paper Award, International Workshop on Human-Friendly Robotics (HFR 2019), for work on grasp-oriented myoelectric interfaces for robotic hands.
- 2024: IEEE Italy RAS Chapter "Fabrizio Flacco" Young Author Best Paper Award, awarded to co-author Roberto Meattini for the IEEE Transactions on Robotics paper on robot programming by demonstration with sEMG-based stiffness estimation.

Visiting Academic Positions

- Visiting Researcher, DLR Institute of Robotics and Mechatronics, Germany, October 2001–April 2002: Cartesian impedance control for the DLR-Hand II dexterous robotic hand, in collaboration with Gerd Hirzinger and Hong Liu.
- Invited Lecturer, UPC Barcelona, April 2005: lectures on Dexterous Manipulation with Robotic Hands for the PhD programme in Automation and Robotics.

Teaching Activities and PhD Supervision

- Since 2003: undergraduate, graduate and specialist teaching in Automatic Control, Systems and Control Theory, Robotics and Mechatronics at the University of Modena and Reggio Emilia.
- Current teaching: Automatic Control for the MSc programmes in Mechanical Engineering and Vehicle Engineering; Smart Robotics for the MSc programme in Artificial Intelligence Engineering; Control and Automation Systems Structure for teacher training.
- Since 2009: member of the PhD Board in Information and Communication Technologies (ICT), UNIMORE; supervisor/co-supervisor of 6 PhD students in collaborative robotics, programming by demonstration, physical human-robot interaction, rehabilitation/surgical robotics, multimodal interaction and AI-based robotics.

Other Work Experience (e.g., Consultancy)

- Scientific consultancy and applied research with companies in automation, robotics and motion control, including IMA, GD-Coesia and SACMI.
- Principal investigator/scientific coordinator of several industrial research contracts with CNH Industrial on diagnostics and prognostics for electro-hydraulic systems, CVT optimization, virtual validation environments and active suspension control for agricultural vehicles.
- Specialized industrial training on robot kinematics, trajectory planning, servo-drive motion profiles and advanced motion control.

Administrative Roles and Positions of Responsibility

- 2017–2018: Member of the Teaching Committee, Department of Engineering “Enzo Ferrari” (DIEF), UNIMORE.
- Since 2022: Member of the Joint Committee of Faculty and Students (Commissione Paritetica Docenti-Studenti), DIEF.
- Since 2023: Member of the Quality Assurance Committee of the ICT PhD Programme, UNIMORE.
- Since 2025: Director of the teacher training programme for class B-15, Laboratories of Electrical and Electronic Sciences and Technologies.
- Since 2026: Member of the Research Committee of DIEF; member/president of academic recruitment and PhD examination committees in Italy and abroad.

Scientific Organisations / Coordination of Academic Activities

- Member of the ICT PhD Board at UNIMORE since 2009; coordinator/director of the B-15 teacher-training path since 2025.
- Member of evaluation committees for academic positions and PhD final examinations at national and international universities, including the University of Bologna, Universitat Politècnica de Catalunya and UMIT Tirol.
- Member of editorial boards, conference editorial boards and program committees of major international conferences in robotics and control, including ICRA and IROS.

Editorial Activity

- Associate Editor for IEEE Robotics and Automation Letters (RA-L), since 2021; Associate Editor for IEEE Access, 2019–2022.
- Reviewer for leading journals in robotics, automation and control, including IEEE Transactions on Robotics, IEEE Transactions on Automatic Control, IEEE Transactions on Control Systems Technology, IEEE Transactions on Mechatronics, Automatica, Control Engineering Practice and the International Journal of Robotics Research.
- Reviewer and Conference Editorial Board (CEB) / International Program Committee (IPC) member for ICRA, IROS, CDC, ECC, ACC, CASE, AIM, SYROCO and the IFAC World Congress.

Membership of Scientific Societies

- Member of the IEEE Robotics and Automation Society (IEEE RAS).
- Member of SIDRA – Società Italiana dei Docenti e Ricercatori in Automatica.

Funding (Current and Past)

- 2025–2029: ZELDA, Horizon Europe – Project Participant.
- 2025–2027: I-SHARM, Italian Ministry of University and Research (MUR) – Unit Coordinator, UNIMORE.
- 2024–2026: ROBIN3, University of Modena and Reggio Emilia FAR 2024 – Principal Investigator.
- 2023: Cobotic Induction System for Automated Garments Sorting, EIT Manufacturing/EIT – Project Participant.
- 2022: ECOSISTER – Spoke 3, MUR-NRRP / NextGenerationEU – Unit Coordinator, UNIMORE, WP4.
- 2022: Co-MiR, MUR – Unit Coordinator, UNIMORE.