PERSONAL DETAILS

Family name, First name: Bicchi, Antonio
Researcher unique identifier (ORCID): 0000-0001-8635-5571
URL for web site: https://www.iit.it/people/antonio-bicchi

- **Education**

1989 PhD in Mechanical Engineering, Università di Bologna, Italy
1984 Laurea degree (Master) in Mechanical Engineering, Università di Pisa, Italy

- **Current position(s)**

2013 – Adjunct Professor, Arizona State University, USA
2009 – Senior Scientist, Istituto Italiano di Tecnologia, Genova, Italy
2001 – Professor of Automatic Control and Robotics, Università di Pisa, Italy

- **Previous position(s)**

2019 – 2025 Founding President, Italian Institute for Robotics and Intelligent Machines, I-RIM
2010 – 2013 President, Italian Society of Researchers in Automatic Control (SIDRA);
2004 – 2012 Director, Interdepartmental Research Center "E. Piaggio", Italy
2007 Adjunct Professor, Dept. of Psychology, Università di Firenze, Italy
1991 – 1996 Adjunct Professor, Department of Information Engineering, Università di Siena, Italy
1990 – 1991 Visiting Scientist, Artificial Intelligence Laboratory, Massachusetts Institute of Technology, USA

- **Professional service (Selection)**

2023 – Editor in Chief, *Int. Journal of Robotics Research*;
2022 – Editor, *Annual Reviews in Control, Robotics and Autonomous Systems*
2020 General Chair, Robotics Science and Systems, RSS'20, Corvalis, Oregon
2019 Founding General Chair, I-RIM 3D, Rome
2019 Program Chair, Robotics Science and Systems, RSS'19, Freiburg, Germany
2015 – 2019 Founding Editor in Chief, *IEEE Robotics and Automation Letters*;
2017 – 2019 Elected Member of the Advisory Committee (AdCom) of IEEE Robotics and Automation Society
2016 Program Chair, IEEE Int. Conf. Robotics and Automation, ICRA'16, Stockholm, Sweden
2011 – 2015 Editor in Chief, *Springer Series "Briefs in Control, Automation and Robotics";*
2009 – 2013 Editorial Advisory Board, Springer Ser. on Touch and Haptic Systems;
2013 – 2014 IEEE Robotics and Automation Society, Vice-President for Publication Activities;
2008 – 2011 Editor in Chief, *IEEE RAS Conference Editorial Board;*
2007 General Chair, International Conference on Hybrid Systems: Computation and Control HSCC'07, Pisa, Italy
2005 Founding General Chair, IEEE WorldHaptics, Pisa, Italy

- **Commissions of Trust (Selection)**

2025 – Advisory Board, Department of Robotics. Mohammed Bin Zuai University of Artificial Intelligence MBZUAI, Abu Dhabi
2025 – Scientific Advisory Board, Human AugmentatioN via Dexterity (HAND) Engineering Research Center, National Science Foundation, USA
2024 – Selection Committee for Professorship Recruiting, ETH Zurich
2022 – Science Advisory Board, Munich Institute of Robotics and Machine Intelligence (MIRMI), Technical University of Munich, Germany
2022– Advisory Board, Berkeley SkyDeck Europe, Milan;
2017 – Advisory Board, Ins. Systèmes Intelligents et Robotique (ISIR), Sorbonne, Paris;
2021 Selection Panel, Distinguished Professorship Chairs, Sweden;
2019 – 2020 Selection Committee, Linnaeus Centers of Excellence, Sweden;
2020 Expert Committee for the National Research Plan for the Italian Ministry of University and Research, Italy
2019 COMET Program Evaluation Panel, Austria;
2016 Evaluation Panel, Ho-Am Foundation Prize, Korea;
2016 Evaluation Panel, Ministry of Education, Science and Sport, Republic of Slovenia;
2016 Evaluation Panel, Samsung Research Funding Center, Korea;
2016 Evaluation Panel, Deutsche Forschungsgemeinschaft (DFG) German Research Foundation;
2014 Chair, Selection Committee for Physical Sciences and Engineering, and Head of the PE-7 panel for the Scientific Independence of Young Researchers (SIR) programme, Italian Ministry of Education and Research
2013 Chair, Selection Committee for Physical Sciences and Engineering, and Head of the PE-7 panel for the FIR (Future in Research) Program, Italian Ministry of Education and Research

2012 Member, Evaluation committee of "Severo Ochoa" Centers of Excellence, Spain;
2011, 2012 Agence Nationale de la Recherche, Evaluation Panel SIMI 3, France;

- **Activities with ERC**

2025 – 2026 ERC Proof of Concept Grant 101212751, Variable Stiffness Upper Limb Prosthesis (VSoft Pro)
2022 – 2023 ERC Proof of Concept Grant 101069179, Wearable Integrated Soft Haptic Display for Prosthetics (WISH)
2019 – 2025 ERC Synergy Grant 810346 Natural Integration of Bionic Limbs via Spinal Interfacing (NBS). Co-PIs: D. Farina (Imperial College, London), O. Aszmann (Medical Univ, Wien).
2019 – 2020 ERC Proof of Concept Grant 840446, Commercial feasibility of an integrated soft robotic system for industrial handling (SoftHandler)
2017 – 2018 ERC Proof of Concept Grant 727536, A Soft Synergy-based Hand Prosthesis with Hybrid Control (SoftHand Pro-H)
2012 – 2017 ERC Advanced Grant 291166 A Theory of Soft Synergies for a New Generation of Artificial Hands (SOFTHANDS)
2015 – 2021 ERC Advanced Grants Evaluation Panel (2015, 2017, 2019, 2021);
2009 – Reviewer for StG, CoG, AdG, SyG panels

- **Other Funding (Selection)**

2025 – 2029 Horizon Europe Grant 101189600, "FlexCycle - Flexible robotic solutions for the recycling of soft materials", Coordinator.
2020 – 2029 Intellimech Contract "JOiiNT Lab", Long-term Technology Transfer plan with Bergamo Industrial Echosystem (1.3MEUR/yr, 5+12 years)
2023 – 2026 National Institute of Health, R01 Project "SoftHand Pro@Home", Mayo Clinic, Arizona State University;
2022 – 2026 Horizon Europe Grant 101070596 "euROBIN - European ROBotics and AI Network"
2024 – 2029 Horizon Heritage Grant 101158046, "AUTOMATA - AUTOMated enriched digitisation of Archaeological liThics and cerAmics"
2023 - 2026 National Recovery and Resilience Plan, "RAISE - Robotics and AI for Socio-economic Empowerment"
2022 – 2026 Complementary National Recovery and Resilience Plan PNC0000007 "Fit4MedRob - Fit for Medical Robotics"
2020-2024 H2020 ICT 2019-2, "SOPHIA Socio-physical Interaction Skills for Cooperative Human-Robot Systems in Agile Production"
2016-2020 H2020 ICT24 "SoftPro: Synergy-based Open-source Foundations and Technologies for Prosthetics and RehabilitatiOn" (coordinator).
2014-2016 Mayo Clinic Benefactor Grant "Soft-Hands for Prostheses"

- **Industry advisory roles (Selection)**

2013 – Member and President, Adv. Ind. Research Consortium "Intellimech" KmRosso, Bergamo
2016 – 2025 Member of Advisory Board, Robotics Fund, Pictet Asset Management, Geneva
2022 – Member of the Advisory Board, Berkeley SkyDeck Europe, Milan

- **Bibliometrics**

>550 peer reviewed papers; H-index 87 (GS); Number of citations: 37000 (GS). Stanford/Elsevier's "Top 2% Scientists of All Times" August 2024 update ranks: no. 8819 (top 0.08%) overall; no. 153 in Artificial Intelligence & Image Processing; no. 69 in Industrial Engineering & Automation.

- **Patents (Selection)**

2021 "Prosthetic feedback device", Barontini F., Bicchi A., Bianchi M. *et al*, Università di Pisa & Fond. Istituto Italiano di Tecnologia , Publication no: US2024139001A1 (2021-03-04)
2020 "Adaptive Robotic Foot", Bicchi A., Garabini M., Grioli G., Catalano M.G. *et al.* Università di Pisa & Fond. Istituto Italiano di Tecnologia, Publication no: US2023382476A1 (2020-10-20)
2017 "Artificial Hand", Bicchi A., Catalano M. G., Della Santina C., Grioli G., Piazza C., Garabini M. Università di Pisa & Fond. Istituto Italiano di Tecnologia, Application number: PCT/IB2017/052684 (2017-05-09)

- **Awards**

2025 IEEE Pioneer in Robotics and Automation. Citation: "For pioneering fundamental contributions to artificial hands, haptics, and human-robot collaboration, and for their applications to robotics and prosthetics"
2023 King-Sun Fu Memorial Best IEEE Transactions on Robotics Paper Award – Honorable mention
2019 Ordine del Cherubino (highest recognition of the University of Pisa)
2018 IEEE RAS George Saridis Leadership Award in Robotics and Automation.

2017 Award for Excellence, top 10 most cited papers since first publication of the Elsevier *Mechanism and Machine Theory Journal*

- **Peer recognition (Selection)**

2024 Distinguished Lecture Series @Science of Intelligence Cluster of Excellence - Berlin, Germany. "What is it like to be a bot?"
2023 Distinguished Lecture, Slovenian-Italian Association, Josip Stefan Institute, Ljubliana, Slovenia. "Robotics. What comes next?"
2023 Plenary Lecture, Philosophy and Mathematics of Situated Agency (Pamosa), Oulu (Finland).
2022 Plenary Lecture, Int. Conf. Robotics and Automation ICRA'22, Philadelphia, PA, USA (premier meeting in the community, ca. 4500 attendees). "The Embodied Intelligence Aporia"
2021 Shirley Ryan Ability Labs Webinar Series, July 26, 2021. "Think Soft: From Robotics to Prosthetics and Rehab, How Soft Tech is Changing the Game."
2021 Humanoids 2021, Plenary Lecture, July 20, 2021: "How to design and control naturally moving machines, and why."
2021 Robotics Today (MIT blog), March 2021. "Planning and Learning Interaction with Variable Impedance".
2021 Technology Innovation Institute of the Arab Emirates Seminar "From Robotics to Prosthetics and Back Again" March 10, 2021.
2021 Accademia dei Lincei, "Verso la Persona Aumentata: Tecnologia ed Etica delle Sinergie Bioniche", March 5, 2021

- **ADDITIONAL INFORMATION**

I have been working on robotic manipulation and bio-robotics throughout all my research career. I have also cultivated other aspects of embodied intelligence, in the framework of a more abstract interest in systems and control theory. My work in the fields of robotics, haptics, and control has independently reached wide recognition, so that I consider myself a respected specialist in each field individually. However, the common thread throughout my work is my passion for hands and the sense of touch, both human and artificial. Manipulation is the ability that set humans apart from other animals in their evolution, and hands represent to me not just the enabler, but to a large extent the core of embodied intelligence.

In the 2010-2014 project "The Hand Embodied" I led a group of outstanding international researchers who established a new paradigm in the understanding of postural synergies and brought it to bear to the design of breakthrough soft robot hands. I am deeply indebted to ERC for the accomplishment of my research aims. My 2011 ERC AdG "SoftHands" allowed me to apply such ideas to prosthetics, opening up a complete new direction in the field. This AdG had an excellent "return on investment": taking citations as a shorthand for impact, GS h-index doubled from 28 in 2010 to 57 in 2018; cites tripled from 4900 to 16500. The subsequent 2019 ERC SyG, with co-PIs Oskar Aszmann and Dario Farina, put our previous work in new light and opened up perspectives of direct integration of our prostheses with the patient's corticospinal motor control mechanism previously unheard of. The SyG was an even more powerful lever (as of today, h-index 87, and 37,000 citations). Alongside the major grants, the ERC enabled translation of my research towards real-world applications with four Proof of Concept grants. In these years I had excellent students, wide recognition, and generous concurrent funding from private, EU and US agencies (NIH, DARPA). These factors also allowed me to start spin-off companies making an economic and social impact (e.g., PurePowerControl, qbrobotics, Exsensia). The NeuroBionicS proposal is an ambitious attempt at pushing the envelope of our current understanding and technologies, to address the huge societal problem of rehabilitation from stroke.

I am continuously engaging general public by making research of my group open source (https://www.naturalmachinemotioninitiative.com) and by giving public talks on robotics, soft robots and implications of technology to our society, including a plenary lecture at ICRA'22, talks at Robotics Today and at Science of Intelligence. Last but not least, a true blessing and the accomplishment I am most proud of is the mentoring of talented young researchers. To date, I have supervised to completion more than 80 Ph.D.s, with 13 ongoing, and 26 postdocs. Among them, 50 have started successful careers in industry, 20 are professors in academia and research institutions, and 9 have become entrepreneurs. Some of my early students are today fully accomplished, with roles ranging from Director of research institutions to Editor in Chief of IEEE Transactions. In the recent generations, seven former students were finalists of the prestigious ``G. Giralt Award" for Best Ph.D. thesis in Robotics in Europe, and three (M.G. Catalano, C. Della Santina, and G.B. Averta) won this award in 2013, 2019, and 2020, respectively. A. Altobelli and F. Barontini won the EuroHaptics Best Ph.D. Thesis award from the EuroHaptics Society in 2015 and 2023. The IEEE RAS Early Career Award was awarded to A. Ajoudani e C. Della Santina in 2021 and in 2023.