

PERSONAL INFORMATION

Family name, First name: CIPRIANI, CHRISTIAN
 Researcher unique identifier(s): SCOPUS ID: 22937071600
 Contacts: email: ch.cipriani@santannapisa.it
 URL for web site: <https://scholar.google.com/citations?user=zYwPjhsAAAAJ&hl=it>
<https://www.santannapisa.it/it/christian-cipriani>

EDUCATION

2008 PhD in Biorobotic Science and Engineering Mark "Excellent"
 IMT Institute for advanced studies, Lucca, Italy
 2004 MSc Electronic Engineering Mark 110/110
 University of Pisa, Italy

CURRENT POSITIONS

Since 12/2023 Dean (*Preside – 110+ faculty members, 125+ honors college students*)
 Classe di Scienze Sperimentali, Scuola Superiore Sant'Anna (SSSA), Pisa, Italy
 Since 12/2016 Professor of Bioengineering
 The BioRobotics Institute, SSSA, Pisa, Italy (*youngest full professor in Italy at the time*)
 Since 03/2009 Founder and CSO
 Prensilia SRL, Pisa, Italy (*Spin-off company that manufactures robotic hands*)

PREVIOUS POSITIONS

2017 – 2023 Director (*equivalent to Head of Department – 330+ people*)
 The BioRobotics Institute, Scuola Superiore Sant'Anna (SSSA), Pisa, Italy
 website: <http://www.santannapisa.it/en/institute/biorobotics/biorobotics-institute>
 2014 – 2017 Associate Professor of Bioengineering (tenured)
 The BioRobotics Institute, Scuola Superiore Sant'Anna, Pisa, Italy
 2011 – 2014 Assistant Professor
 The BioRobotics Institute, Scuola Superiore Sant'Anna, Pisa, Italy

FELLOWSHIPS AND AWARDS

2019 **"Valore Award" (Premio Valore)**, Associazione Valore Uomo, Rome, Italy. Award conferred under the endorsement of the Italian Prime Ministry to individuals who have excelled in their professions and contributed to improve social welfare. Awarded for the scientific results achieved by the DeTOP H2020 project, coordinated by the PI.
 2018 **Best Poster Award** at the International Conference on Neurorehabilitation, Pisa, Italy.
 2017 **National Scientific Habilitation(s)**, Ministry of Education and Research, Italy. As Full Professor (in 2017) and Associate Professor (in 2014) in BioEngineering.
 2015 **Starting Grant, European Research Council**: "A Bidirectional MyoKinetic Implanted Interface for Natural Control of Artificial Limbs: MYKI". (1.500.000 € - 5 years)
 2011 **FIRB 2010 under 33 early-career grant**, Ministry of Education and Research, Italy: "Myoelectric-Hand prosthesis with Afferent Non-invasive feedback Delivery: MY-HAND", (320.000 € - 3 years). (*2% acceptance rate*)
 2011 **"Fulbright Research Scholar" grant**, Fulbright Foreign Scholarship Board, Washington DC, USA, to pursue research at the Dept. of Bioengineering of the University of Colorado, as Visiting Scientist in Prof. Weir's laboratory (6 months: March 2012-Sept. 2012).
 2009 **"Antonio d'Auria Award" (Premio Antonio d'Auria)** from SIRI (Italian Robotics and Automation Association), Milan, Italy. Winner with the project: Biomechatronic underactuated transradial prosthesis: SMARTHAND.

SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

2009 – 2023 ~60 graduate students (among them ~30 PhD students) and post-docs from various national and international universities. These activities led to several co-authored peer-reviewed journal and conference publications.

TEACHING ACTIVITIES

2023 – now Lecturer: “Rehabilitation Robotics”, MEET Program (medicine enhanced by engineering technologies), University of Pisa and Scuola Superiore Sant’Anna, Italy (10 hours, yearly course).

2016 – now Lecturer: “Artificial Limbs”, MSc in Bionics Engineering, University of Pisa and Scuola Superiore Sant’Anna, Italy (60 hours, yearly course).

2014 – now Lecturer: “Embedded control systems”, Honours college undergraduate students at Scuola Superiore Sant’Anna, Pisa, Italy (30 hours, yearly course).

2012 – 2013 Lecturer: “Electrical control systems (for biomedical robots) and instrumentation”, PhD in BioRobotics at Scuola Superiore Sant’Anna (40 hours).

INSTITUTIONAL RESPONSIBILITIES

2023 – now **Dean**, Faculty of experimental and applied sciences (Classe di Scienze Sperimentali), SSSA (*elected*).

2021 – 2022 Member, **Supervisory Board** appointed by the Ministry of Research for the National Recovery and Resilience Plan (NRRP) Mission 4 (*appointed by the Minister of Research*).

2017 – 2023 **Director**, The BioRobotics Institute, SSSA (*elected*).

2014 – 2017 Deputy Director, The BioRobotics Institute, SSSA (*appointed by the Director*).

2012 – 2023 Elected member of the Assistant Professors (‘12-‘14), of the Professors (‘14-‘16), then as the Director (‘17-‘23) in the Governing Board of the BioRobotics Institute, SSSA.

2011 – now Member, Faculty Committee of the PhD Program in BioRobotics, SSSA.

2019 – 2022 Deputy Dean, Faculty of experimental and applied sciences of the SSSA (*appointed by the Dean*).

2014 – now Member, Faculty of experimental and applied sciences of the SSSA.

2014 – now Scientific responsible of the REPAIR (Rehabilitation Engineering and Prothetics Applied Innovation & Research) joint Lab, between SSSA and INAIL Centro Protesi in Budrio (BO), Italy. (*INAIL is the national workers’ compensation institute*).

2012 – now Member of Ethical and Advisor Board for the Agreement between SSSA and the Italian Association of Work Injured (ANMIL). (*350.000 associates nationwide*)

REVIEWING ACTIVITIES

2024 – now **ASN Committee member** (National Scientific Habilitation) (Commissione parallela ASN).

2012– now **Remote reviewer** (funding agencies): European Research Council (ERC), Atlantic Canada Opportunities Agency (ACOA), Iceland Center for Research (RANNIS), Australian National Health and Medical Research Academy (NHMRC), Swiss National Competence Center for Research in Robotics (NCCR).

2013 – now **Review panel member** (PhD defences or career promotions): universities of Cagliari, Twente, Houston, Strathclyde, Rome Tor-Vergata, Rome Campus Biomedico, Italian Institute of Technology - Genoa.

2015 – now **Associate Editor**: Applied Bionics and Biomechanics, IEEE Journal of Translational Engineering in Health and Medicine (since 2015), IEEE Trans. on Medical Robotics and Bionics (since 2019).

2010 – now **Reviewer** (journal – *partial list*): Applied bionics and biomechanics, Biomedical engineering on-line, IEEE Robotics & Automation Magazine, IEEE Trans. on {Biomedical Engineering, Haptics, Neural Systems and Rehabilitation Engineering, Robotics}, IEEE/ASME Trans. on Mechatronics, Intl. Journal of Robotics Research, Journal of {Biomechanics, Neural Engineering, NeuroEngineering and Rehabilitation, Robotics}, Medical Engineering and Physics, Robotica, Scientific Data, Sensors & Actuators: A. Physical, Sensors.

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

Since 2012	Senior Member, IEEE
2009 – now	Member, IEEE Engineering in Medicine & Biology (EMBS) Member of the EMBS Technical Committee on BioRobotics (since 2015) Chair of the Sub-Committee for Road-mapping (since 2015).
2006 – now	Member, IEEE Robotics and Automation Society
2005 – now	Member, National Group of Bioengineering

CURRENT AND PAST GRANTS (2020 update)

<i>Project Title</i>	<i>Funding source</i>	<i>Amount (Euros)</i>	<i>Period</i>	<i>Role</i>
MYKI (A Bidirectional MyoKinetic Implanted Interface for Natural Control of Artificial Limbs" (ERC #679820)	ERC – Starting Grant –H2020	Total funding ~1.475.000 € (funding to the PI 1.475.000 €)	Sept 2016 – Aug 2021	PI
DeTOP (Dexterous Transradial Osseointegrated Prosthesis with neural control and sensory feedback) (ICT #687905)	EC-H2020	Total funding 5.100.000 € (773.000 €)	March 2016 – Feb 2020	Coordinator and PI
CECA-2020 (Protesi funzionale di arto superiore con mano multi-articolata sensorizzata a controllo bio-mimetico non invasivo).	INAIL (National Workers' Compensation)	Total funding 900.000 € (900.000 €)	April 2017 – March 2020	PI
PCR 1/1 (Nuove metodologia per il trattamento delle amputazioni di arto mediante osteointegrazione)	INAIL (National Workers' Compensation)	Total funding 1.600.000€ (100.000€)	July 2017 – July 2021 (48 months)	CO-PI
ARLEM (Activity Recognition and Limb position Effect compensation for Myokinetic hand prostheses # R16H2KJRHA)	Italian Ministry of Education and Research	Total funding 177.000 € (177.000 €)	Jan 2018 – Dec 2022	PI
WAY (Wearable interfaces for hAnd function recoverY) (ICT #288551)	EC-FP7	Total funding 2.250.000€ (797.000€)	2012-2015 (44 months)	Coordinator and PI.
NEBIAS (NEurocontrolled BIDirectional Artificial upper limb and hand prosthesis) (ICT #611687)	EC-FP7	Total founding 3.500.000€ (820.000€)	2013-2017 (48 months)	CO-PI
CogLaboration (Successful real world human-robot collaboration: from the cognition of human-human collaboration to the cognition of fluent human-robot collaboration) (ICT #287888)	EC-FP7	Total funding 2.520.000€ (430.000€)	2012-2014 (36 months)	CO-PI
MY-HAND (Myoelectric Hand prosthesis with Afferent Non-invasive feedback Delivery) (FIRB 2010)	Italian Ministry of Research	Total funding 320.000€ (320.000€)	2012-2015 (44 months)	Coordinator and PI.
PPR3 (Sviluppo di un sistema protesico nelle amputazioni digitali della mano)	INAIL (National Workers' Compensation)	Total funding 1.700.000€ (1.700.000€)	2014-2016 (36 months)	PI

EARLY ACHIEVEMENTS TRACK-RECORD

I am a (bio)roboticist by education and research. I have been working for 19 years in the broad area of upper limb prosthetics and hand function recovery. I am interested in mechatronic, controllability and sensory feedback issues of dexterous robotic hands to be used as thought-controlled prostheses. On these topics I have authored 180+ peer reviewed scientific papers, **100+** of which in the top biomedical engineering journals (e.g., *Science Translational Medicine*, *IEEE Trans. on Biomedical Engineering*, *IEEE Trans. on Neural Systems and Rehabilitation Engineering*, *Journal of Neural Engineering*) robotics journals (e.g., *Science Robotics*, *IEEE Trans. on Robotics*, *IEEE Robotics and Automation Magazine*), and also in broader impact journals (e.g., *Advanced Science*, *PLOS ONE*, *Scientific Reports*, *Scientific Data*).

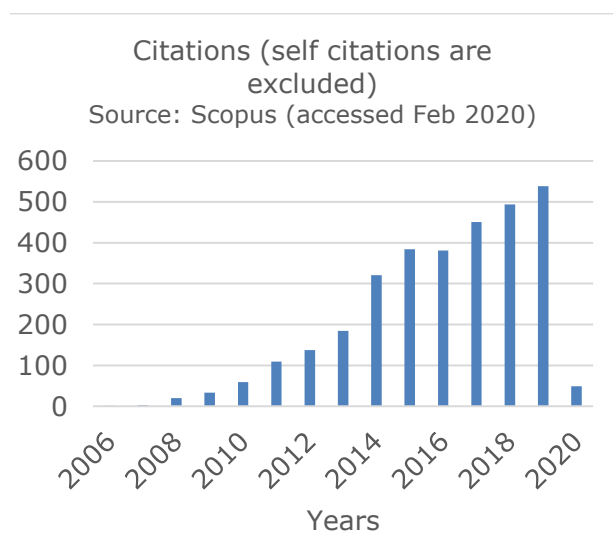
I lead the Artificial Hands Area at SSSA, a research group sponsored by the Italian Workers' Compensation Authority (INAIL), the Italian Ministries of Research, of Health, of Defence, the European Commission (EC), and the European Research Council (ERC). This is one of the most prominent intellectual hubs on upper limb prosthetics research, and among the largest groups worldwide (25+ people) working in this field.

My research is internationally recognized and has been strengthened in the past years by several collaborations and funding, including **two European projects** which I have **coordinated** (WAY#288551 and DeTOP #687905), prestigious early grants like the **FIRB2010**, and the **ERC Starting** (#679820) and **POC** (in 2024). Notably, within the framework of the H2020 project DeTOP, the first chronic **osseo-neuromuscular implant** for control and sensory feedback of a dexterous and sentient transradial hand prosthesis, was successfully implanted in 2019. Within the framework of the ERC Starting Grant MYKI, the **first myokinetic prosthetic hand**, was successfully demonstrated in an amputee in 2023. In 2022 I coordinated the preparation of a proposal and was later appointed as **Scientific Director** of a large national Initiative, named Fit4MedRob, probably the largest project on rehabilitation robotics ever funded in Italy/Europe (126 M€), funded by the Ministry of Research.

I have often been invited to conferences and universities worldwide, as well as in prominent media (RAI, Sky, BBC, Telegraph,...) and outreach events (fairs, museums, international festivals). Also I was granted **8 patents** on hand design and control and I started a spin-off company of the Scuola Sant'Anna: Prensilia (www.prensilia.com), which develops and commercializes artificial hands for research and industry. Thanks to its flexibility, today the *IH2 Azzurra hand* developed by Prensilia is one of the most widely used by researchers across the world in the fields of upper limb prosthetics and human machine interfaces. The *MIA hand*, also developed by Prensilia and supported through research grants I have obtained, received the Red-Dot Design award in 2019, the Compasso D'Oro award in 2022 and will be marketed as a biomedical device starting from 2024.

I have two long-term objectives: the first is to build to perfection something which could practically improve the everyday life of disabled individuals. The second is to become the leading scholar in this field. In my paths towards these goals, I have been fortunate enough to be promoted full **professor** at a

very young age (36) and to be elected to serve in important institutional roles, such as **Director** of my Institute – an internationally recognized institution in the fields of biorobotics and bionics (sssa.bioroboticsinstitute.it) (330+ people), and after two mandates, **Dean** of the Faculty of Experimental Sciences (110+ faculty members).



Publication summary: 100+ journal papers (first author: 13; **last author: 40+**), 35+ peer-reviewed conference papers, 30+ short papers. H-index: 42 (Scopus), 51 (Scholar). Citations: 6913 (Scopus), 10000 (Scholar).

Latest publications as main author (complete list: <https://www.santannapisa.it/it/christian-cipriani>)

1. V. Ianniciello, M. Gherardini, **C. Cipriani**, “Transcutaneous Magnet Localizer for a Self-Contained Myokinetic Prosthetic Hand,” *IEEE TBME*, 2023.
2. M. Ortiz-Catalan, J. Millenaar, D. D’Accolti, M. Controzzi, F. Clemente, L. Cappello, E. J. Earley, E. Mastinu, J. Kolankowska, M. Munoz-Novoa, S. Jossen, **C. Cipriani**, P. Sassu, et al. . . . “A highly integrated bionic hand with neural control and feedback for use in daily life”, *Science Robotics*, 8(23), 2023.
3. E. Mastinu, A. Coletti, SHA Mohammad, J. van den Berg, **C. Cipriani**, “HANDdata—first-person dataset including proximity and kinematics measurements from reach-to-grasp actions”, *Scientific Data*, 2023.
4. F. Paggetti, M. Gherardini, A. Lucantonio, **C. Cipriani**, “To what extent implanting single vs pairs of magnets per muscle affect the localization accuracy of the myokinetic control interface? Evidence from a simulated environment”, *IEEE TBME*, 2023.
5. M. Gherardini, F. Masiero, V. Ianniciello, **C. Cipriani**, “The Myokinetic Interface: implanting permanent magnets to restore the sensory-motor control loop in amputees”, *COBME*, 2023.
6. D. D’Accolti, F. Clemente, A. Mannini, E. Mastinu, M. Ortiz-Catalan, **C. Cipriani**, “Online Classification of Transient EMG Patterns for the Control of the Wrist and Hand in a Transradial Prosthesis”, *IEEE RAL*, 8(2): 1045-1052, 2023.
7. D. D’Accolti, K. Dejanovic, L. Cappello, E. Mastinu, M. Ortiz-Catalan, **C. Cipriani**, “Decoding of multiple wrist and hand movements using a transient EMG classifier”, *IEEE TNSRE*, 31: 208-217, 2022.
8. L. Cappello, D. D’Accolti, M. Gherardini, M. Controzzi, **C. Cipriani**, “A 2-Degree-of-Freedom Quasi-Passive Prosthetic Wrist With Two Levels of Compliance”, *IEEE RAL*, 8(3): 1231-1238, 2022.
9. M. Gherardini, A. Sturma, A. Boesendorfer, V. Ianniciello, A. Mannini, O. C. Aszmann, **C. Cipriani**, “Feasibility Study On Disentangling Muscle Movements in TMR Patients Through a Myokinetic Control Interface for the Control of Artificial Hands,” *IEEE RAL*, 7(3): 7240-7246, 2022
10. M.Montero, Z.C. Thumser, F. Masiero, D. Beckler, F. Clemente, P.D. Marasco, **C. Cipriani**, “The myokinetic stimulation interface: activation of proprioceptive neural responses with remotely actuated magnets implanted in rodent forelimb muscle,” *JNE*, 19(2), 2022.

Selected invited talks and colloquia:

- | | |
|------|--|
| 2024 | ① School and Symposium of Advanced Neurorehabilitation, <i>SSNR 2024</i> , Baiona, Spain, <i>Plenary Speaker</i> . ② National Congress SIRN, Florence, Italy. |
| 2023 | ① International Workshop on Osseointegration and Bionic Limb Reconstruction, Bologna, Italy. ② CNR IEIIT, Milan, Italy. ③ IRCCS Don Carlo Gnocchi, Rome, Italy. |
| 2019 | Institute Cognitive and Clinical Neuroscience, Central Institute of Mental Health, Mannheim, Germany. |
| 2018 | Robotics Research Jam Session, University of Pisa, Italy. |
| 2017 | ① Computer Science and Electronic Engineering Conference, <i>CEEC 2017</i> , University of Essex, Colchester, UK, <i>Keynote Speaker</i> . ② School and Symposium of Advanced Neurorehabilitation, <i>SSNR 2017</i> , Baiona, Spain, <i>Plenary Speaker</i> . ③ Symposium at the IEEE EMBS Neural Engineering Conference, Shanghai, China. ④ Jiao Tong University, Shanghai, China. ⑤ Boğaziçi Üniversitesi, Istanbul, Turkey. |
| 2016 | II Semana Bioengenharia, Instituto Superior Tecnico Lisbon, University of Lisbon, Portugal, <i>Key-note talk</i> . |
| 2015 | Symposium organized at the ISPO World Congress, Lyon, France. |
| 2014 | ① 6 th Symposium on Bioengineering, Faculty of Engineering, University of Porto, Portugal. ② European BCI Day, 6 th Intl. Brain-Computer Interface Conf., Graz, Austria. |
| 2013 | ① Department of Electrical Engineering, Newcastle University, UK. DEMOVE symposium: Translational engineering in neurorehabilitation, Medical University of Göttingen, Germany. ② TIRR Memorial Hermann Rehabilitation Hospital, Houston, Texas. ③ Department of Electrical & Computer Engineering, University of Houston, Texas. ④ Department of Engineering, Cambridge University, UK. ⑤ MYOSENS Workshop - Department of Neurorehabilitation Engineering University Medical Center Göttingen. ⑥ Department of Mechanical Engineering, Instrumentation & Robotics Special Seminar, Massachusetts Institute of Technology, Cambridge, Massachusetts. |
| 2012 | ① Vanderbilt University, Nashville, Tennessee. ② Department of Electrical & Computer Engineering, University of Houston, Houston, Texas. ③ Olin Engineering Center, Marquette University, Milwaukee, Wisconsin. ④ Medical College of Wisconsin, Milwaukee, Wisconsin. |