Europass Curriculum Vitae

Personal information

Name / Surname	**Cordella Francesca**
Personal Email	
Nationality	
Date of birth	
Research Unique Identifier	SCOPUS ID: 55388280900 ORCID ID: 0000-0002-6946-0377

Current employment

Assistant Professor with tenure track (RTDb) at the Campus Bio-Medico University of Rome, Unit of Advanced Robotics and Human-centred Technologies

National Scientific Habilitation

Italian National Scientific H abilitation a s A ssociate P rofessor i n Bioengineering (09/G2). Period of validity: 04/05/2021 - 04/05/2030 (art. 16, comma 1, Legge 240/10)

Bibliometric indices

	Scopus	Scholar
Number of total documents	99	114
h-index	19	22
Number of citations	1628	2326

Education and training

2008—2011 Doctor of Philosophy in Computer Science and Automation Engineering, received by the University of Naples Federico II

- Thesis title: Grasping algorithms for anthropomorphic robotic hands

2008 State certification in order to practice as an engineer

a.a. 2006-2007 Electronic Engineering degree at the University of Naples Federico II

- Thesis in Robotics: Technologies for the simulation of laparoscopic surgery
- Mark: 110/110

Professional experience

February 2022—present Assistant Professor with tenure track (RTDb) at Campus Bio-Medico University of Rome, Unit of Advanced Robotics and Human-centred Technologies

December 2021—January 2022 Collaboration contract for research activities with the Campus Bio-Medico Univer- sity of Rome in the framework of the research project WiFi-MyoHand

November 2018—November 2021 Assistant Professor (RTDA) at Campus Bio-Medico University of Rome, Research Unit of Advanced Robotics and Human-centred Technologies

November 2017—November 2018	Assistant Researcher at Campus Bio-Medico University of Rome in the framework of the research project PPRAS 1/3—Implantable system for the control of upper limb prostheses with invasive neural interfaces and wireless communication. —Research program title: Experimental validation of the human sensori-motor control on an anthropomorphic arm-hand robotic system.
2018	Evaluator of “La Caixa Foundation" projects in the framework of the “Health Research" Call.
November 2014—November 2017	Assistant Researcher at Campus Bio-Medico University of Rome in the framework of the research project PPR2—Control of upper limb prostheses with invasive neural interfaces. —Research program title: Experimental validation of the human sensori-motor control on an anthropomorphic arm-hand robotic system.
March 2017	Expert Reviewer of European Projects Horizon H2020 for the European Commission in the framework of Personalised coaching for well-being and care of people as they age.
June 2015	Expert Reviewer of European Projects Horizon H2020 for the European Commission in the framework of ICT for active and healthy ageing.
November 2013—November 2014	Assistant Researcher at Campus Bio-Medico University of Rome in the framework of the research project HandBot—Biomechatronic prosthesis hands endowed with bioinspired tactile perception, bidirectional neural interfaces and distributed sensori-motor control. —Research program title: Experimental validation of the human sensori-motor control on an anthropomorphic arm-hand robotic system.
October 2013	Collaboration contract for research activities with the Campus Bio-Medico University of Rome in the framework of the research project NEMESIS—NEurocontrolled MEchatronic ProstheSIS. —Research program title: Development of an anthropomorphic arm-hand robotic platform for grasping and manipulation tasks with high dexterity.
June 2012—June 2013	Collaboration contract for research activities with the Department of Electric Engineering and Information Technologies of the University of Naples Federico II for the National Project PRIN ROCOCÒ—COoperative and COllaborative RObotics. —Research program title: Control of Human-Robot physical interaction.
March—September 2008	Collaboration contract with the Department of Computer Science and Automation of the University of Naples Federico II for the European Project DEXMART (DEXterous and autonomous dual-arm/hand robotic manipulation with sMART sensory-motor skills: A bridge from natural to artificial cognition)

Foreign experiences

January—July 2011	Visiting student at the Institut für Robotik und Mechatronik, Deutsches Zentrum für Luft- und Raumfahrt (DLR), Wessling, Germany under the supervision of Dr. van der Smagt, where she worked on the analysis of human behavior during grasping with the Vicon system and on the development of tracking algorithms for human hand movement using RGB-D cameras

Educational activities

- Teacher of the course "Biomechanics - Modeling and Technologies" (3rd year, BSc in Biomedical Engineering, Università Campus Bio-Medico di Roma, 6 CFU) for the academic years 2024/2025.
- Teacher of the course "Biomechanics" in the framework of the PNRR Next Generation EU project (Università Campus Bio-Medico di Roma) for the academic years 2023/2024.
- Teacher of the course "Human behaviour analysis and understanding for robotics" in the framework of the Department of Excellence (Università degli Studi del Sannio), 2022
- Teacher of the course “Bioengineering and Biomechanics of the human motion” (2nd year, MSc in Biomedical Engineering, Università Campus Bio-Medico di Roma, 6 CFU) for the academic years 2020/2025.
- Teacher of the course “Applied Biomechanics” (3rd year, BSc in Industrial Engineering, Università Campus Bio-Medico di Roma, 6 CFU) for the academic years 2019/2025.
- Teaching assistant for the course “Laboratory of Bioengineering” (3rd year, BSc in Industrial Engineering, Università Campus Bio-Medico di Roma, 6 CFU) during academic year 2019/2020.
- Teaching assistant for the course “Industrial and Medical Robotics” (1st year, MSc in Biomedical Engineering, Università Campus Bio-Medico di Roma, 15 CFU) during academic year 2019/2020.
- Teacher of the course “Laboratory of Bioengineering” (3rd year, BSc in Industrial Engineering, Università Campus Bio-Medico di Roma, 6 CFU) during academic year 2018/2019.
- Teaching assistant for the course “Medical and Industrial Robotics” (1st year, MSc in Biomedical Engineering, Università Campus Bio-Medico di Roma, 15 CFU) during academic year 2017/2019.
- Teaching assistant for the course “Laboratory of Bioengineering” (3rd year, BSc in Industrial Engineering, Università Campus Bio-Medico di Roma, 6 CFU) during academic year 2017/2018.
- Teaching assistant for the course “Medical and Industrial Robotics” (1st year, MSc in Biomedical Engineering, Università Campus Bio-Medico di Roma, 15 CFU) during academic year 2016/2017.
- Teaching assistant for the course “Biomedical Robotics” (1st year, MSc in Biomedical Engineering, Università Campus Bio-Medico di Roma, 12 CFU) during academic year 2014/2016.

Student advisor

Tutor and Supervisor of:

- 14 PhD student in Bioengineering and Bioscience at Università Campus Bio-Medico di Roma (2016 – present). Currently, Francesca Cordella is supervising/co-supervising 8 PhD students on the following topics:
  - Invasive and non-invasive peripheral nerve stimulators for sensory feedback restoration in upper-limb amputees
  - Encoding strategies for restoring somatic sensations in upper-limb amputees
  - Bio-inspired control strategies and sensory system for prosthetic hands
  - Pattern recognition strategies for motion intention reconstruction and workers' muscular fatigue estimation.
  - Assessment of spinal mobility and compensatory movements in patients with chronic low back pain by means a multimodal evaluation platform
  - Evaluation methods for innovative electromyographic and neural electrodes
  - Approaches to estimate joint stiffness from electromyographic and kinematics data for prosthetic arm control.
  - Marker-based and marker-less algorithms to recostruct arm and hand kinematics
  - Modulation methods of Functional Electrical Stimulation for assistive robotics
  - Methods for in-vitro muscle characterization and for biohybrid gripper development
  - Innovative methods and technologies to retrieve motion intention in upper-limb amputees
  - Semiautonomous Control Strategies Based on Computer Vision for robotic hands
  - Vision-based approaches for object and environment recognition for assistive purposes
- 2 Master thesis in Biomedical Engineering at University of Naples Federico II;
- 3 Master thesis in Automation Engineering at University of Naples Federico II;
- 1 Bachelor thesis in Automation Engineering at University of Naples Federico II;
- 1 Bachelor thesis in Biomedical Engineering at University of Naples Federico II.
- 35 Master thesis in Biomedical Engineering at Università Campus Bio-Medico di Roma. Since 2022 Francesca Cordella supervised 10 Master thesis in Biomedical Engineering at Università Campus Bio-Medico di Roma
- 72 Bachelor thesis in Industrial Engineering atUniversità Campus Bio-Medico di Roma (2017 – present). Since 2022 Francesca Cordella supervised 44 Bachelor thesis in Industrial Engineering at Università Campus Bio-Medico di Roma

Institutional Responsibilities

2023 – present

Member of the Group for the Assessment of the Research Quality (AQR) of the Univeristà Campus Bio-Medico di Roma

2023 – present

Member of the Scientific Board of the PhD Program in "Bioengineering, Applied sciences and Intelligent systems" of the Università Campus Bio-Medico di Roma

2023 – present

Member of the Scientific Board of the National PhD Program in Robotics and Intelligent Machines

2023 – present	Member of the Board for the student admission to Degree Courses of Università Campus Bio-Medico di Roma
2019 – present	Coordinator of the Tutorship for the Master degree course in Biomedical Engineering, Università Campus Bio-Medico di Roma
2013 – 2024	Personal Tutor, Università Campus Bio-Medico di Roma

Research interests

The Francesca Cordella's research activities lie at the intersection of biomechanics, robotics and neuroscience. The study of the human biomechanics and of the human sensory-motor and nervous systems aimed at proposing new approaches to improve human behaviour reconstruction and evaluation, bio-inspired control strategies for robotic systems, and innovative methods for restoring the bidirectional communication between the assistive technology and the peripheral nervous system. The research outcomes have been used to guide rehabilitation treatments, robotic device development and control and to propose new assistive technologies, with the common final objective of improving the quality of life of the individuals. During the PhD, the Francesca Cordella's research activities were focused on the development of new protocols and algorithms for reconstructing the human hand kinematics, by means of marker-based and marker-less vision systems. The obtained results were used to develop human-like grasping algorithms for robotic hands. Over the years, this knowledge has significantly expanded, and Francesca Cordella started dealing with i) multimodal interfaces, to retrieve the whole state (i.e. biomechanical, physiological, psychophysiological) of the human being during the interaction with robotic devices, ii) adaptive control strategies, iii) artificial intelligence and iv) robot trajectory planning. The analysis of the human behavior allowed following a user-centred approach during the use of technologies for assistance and rehabilitation: the technology behaviour varies according to the user specific needs and intentions. The Francesca Cordella's expertise and research experience is highly interdisciplinary and strongly benefited from the opportunity of working in the context of several National and International projects (also with the role of activity leader). She took advantage from the close interaction with neuroscientists, medical doctors, stakeholders to understand the real needs of the final users of the assistive technologies. Finally, the understanding of the neural basis of perception and motor control was fundamental to contribute to the development of approaches and techniques (both invasive and non-invasive) for sensory feedback and motion restoration in the fields of prosthetics and rehabilitation. The Francesca Cordella's research interests are mainly related to assistive robotics, rehabilitation robotics and prosthetics, with special reference to biomechanics and biomedical robotics. Her main expertise is concerned with:

- Biomechanical analysis of the human being by means of several motion analysis systems (wearable and not wearable) and development of performance evaluation systems;
- Kinematic protocols for analyzing the performance of human/prosthetic hands.
- Instrumented platforms for the evaluation of human and prosthetic hands and of rehabilitation treatments;
- Vision-based strategies for motion reconstruction and human-robot interaction;
- Human-machine multimodal interfaces for assistive and rehabilitation robotics;
- Adaptive control strategies for collaborative robotics, mainly focused on the assistive and rehabilitation robotics;
- Bio-cooperative systems for upper limb rehabilitation;

- Bio-inspired grasping algorithms with reduced computational cost for anthropomorphic arm-hand robotic/prosthetic systems;
- Human-robot interaction modeling for the control of assistive and collaborative robots;
- Invasive and non-invasive approaches for sensory feedback restoration;
- Closed-loop Functional electrical stimulation for motor recovery;
- Closed loop interfaces for the bidirectional communication with the nervous system.

Participation to national and international research project

December 2023–present: **NoProblem** – Nocicezione e propriocezione per il monitoraggio efficace degli arti robotici (Project funded by INAIL).

- Role in the project: Task Co-Responsible. Francesca Cordella collaborates in the development of encoding strategies to restore pain sensations in upper-limb amputees via transcutaneous electrical stimulation

December 2023–present: **3Daid++** – Protesi di mano e ausili robotici esoscheletrici a basso costo per bambini e adulti (Project funded by INAIL).

- Role in the project: Task Responsible. Francesca Cordella is responsible for the development of marker-based and marker-less protocols for the kinematic reconstruction of adults and children hands. She works also in the definition of specifications for the design of prosthetic hands.

December 2023–present: **BioArmNext** – Esoscheletro portatile per la riabilitazione e l'assistenza del paziente plesso-leso (Project funded by INAIL).

- Role in the project: Task Responsible. Francesca Cordella works in the development of innovative closed-loop functional electrical stimulation strategies for assistive robotics.

December 2023–present: **BioInterNect** – Interfacce bioniche bidirezionali multimodali (Project funded by INAIL).

- Role in the project: Task Co-Responsible. Francesca Cordella collaborates in the development of decoding and encoding strategies for upper-limb prosthesis and of stimulation devices for interfacing with the peripheral nervous system.

December 2020–present: **WiFi-MyoHand** – Sistema impiantabile ottimizzato per l'interfacciamento con il sistema nervoso periferico e il controllo della protesi di arto superiore (Project funded by INAIL).

- Role in the project: Project co-Responsible and Project Manager. Francesca Cordella contributed in writing the project proposal. She contributed in the development of the systems and strategies of a closed-loop prosthetic hand

December 2020–present: **ReGiveMeFive** – Esplorazione di nuove frontiere in chirurgia protesica (Project funded by INAIL).

- Role in the project: Task Responsible. Francesca Cordella was responsible for the muscular evaluation of the subjects that underwent bionic surgery and for the development of the prosthesis control system and of the integration.

November 2020–present: **BioArm** – Esoscheletro portatile per la riabilitazione e l'assistenza del paziente plesso-leso.

- Role in the project: Work package Co-Responsible. Francesca Cordella was responsible for the development of hybrid closed-loop functional electrical stimulation for assistive robotics.

September 2020–present: **SOMA** – Ultrasound peripheral interface and in-vitro model of human somatosensory system and muscles for motor decoding and restoration of somatic sensations in amputees (European project H2020-FETOPEN-2018-2019-2020-01).

- Role in the project: Project Manager and Work package Responsible. Francesca Cordella contributed in writing the project proposal. She contributed in the development of hand prosthesis sensorization and control, of the systems and strategies for motor decoding and restoration of somatic sensations in upper-limb amputees

June 2020–present: **3D-aid** – Low cost prosthetic hands and exoskeletons (Project funded by INAIL).

- Role in the project: Work package Responsible. Francesca Cordella contributed in writing the project proposal. She was responsible for the analysis of human hand kinematics for the design of hand prosthesis

December 2022 – present: **FIT4MEDROB** – Fit for Medical Robotics (PNC Project funded by the Italian Ministry of University and Research)

- Role in the project: Research and development. Francesca Cordella is working on several Match Making (on the hand rehabilitation of post-stroke subjects, on the evaluation of encoding strategies for restoring somatic sensations and of decoding algorithms for recognizing motion intention for upper-limb prosthesis users, on sensory feedback restoration in lower-limb amputees) and on the subproject Implant, where upper-joint stiffness is retrieved from muscular activites to control a prosthesis wrist and elbow joints

July 2022 – present: **Rome Technopole** – Innovation Ecosystem (PNRR Project funded by the Italian Ministry of University and Research)

- Role in the project: Activity responsible. Francesca Cordella is responsible of the open lab on Rehabilitation and Assistive Robotics

July 2018–December 2022: **ANIA** – Development of bionic upper limb prostheses with personalized interface and sensory feedback for severely injured patients with amputation due to road accident (Project funded by ANIA Foundation - Associazione Nazionale per le Imprese Assicuratrici)

- Role in the project: Co-Responsible of the project. Francesca Cordella contributed in writing the project proposal. She was responsible for developing the multimodal interface for the control of the assistive devices and the strategies for restoring sensory feedback in upper and lower limb amputees

April 2019–October 2021: **SAFE-MOVER** – User-centred design of a robotic device for improving working conditions and user subjective perspective during patient-handling movements (Bando University Strategic Projects, Topic: Healthcare 4.0).

- Role in the project: project Co-Responsible. Francesca Cordella contributed in writing the project proposal. She was responsible for the biomechanical and psycophysiological analysis of the users (i.e. patients and caregivers) during the patient-handling task performed with different technologies and for the development of an innovative robotic patient mover

May 2019–October 2021: **SENSE-RISC** – Development of instrumented suits for prevention and mitigation of workers' safety risks (Project funded by INAIL).

- Role in the project: Task Co-Responsible. Francesca Cordella contributed in the development of the approach for workers' risk estimation and prevention

April 2019–January 2021: **EXPERIENCE** – Benchmarking Exoskeleton-Assisted Gait Based on Users' Subjective Perspective and Experience (Open Call of the EU-funded project EUROBENCH - H2020-ICT-2016-2017-779963).

- Role in the project: Task responsible. Francesca Cordella contributed in writing the project proposal. She worked in the development of a strategy to assess the psycophysiological state of exoskeleton users

September 2018–December 2021: **ARONA** – Surgical navigation assisted by advanced robotics. (Project MIUR PON Research and Innovation 2014 – 2020).

- Role in the project: Work package Co-responsible. Francesca Cordella contributed in writing the project proposal. She worked on the human-robot interaction modeling during the execution of robot-mediated surgical operations, on the development of human-robot shared control strategies and on the biomechanical analysis of the surgeons

July 2018–December 2020: **PPR AS 1/3** – Evolution of an implantable system for the control of upper limb prosthesis with invasive neural interfaces, with wireless communication (Project funded by INAIL)

- Role in the project: Project Co-responsible and project manager. Francesca Cordella was responsible for the development and evaluation of the systems and strategies composing the closed-loop hand prosthesis

May 2018–December 2020: **PCR 1/2** – New methods in the treatment of limb amputation, finalized to the application of bionic prostheses (Project funded by INAIL).

- Role in the project: Work package Co-Responsible. Francesca Cordella worked on the development of decoding strategies for recognizing motion intention and on the biomechanical evaluation of upper-limb amputees

January 2018–March 2019: **SIRASI** – Robotic system for upper and lower limb rehabilitation. (Bando INTESE).

- Role in the project: Research and Development. Francesca Cordella collaborated in the development of the control strategy of a robotic manipulator for lower-limb rehabilitation

June 2017–December 2019: **RehabRobo@Work** – Bio-cooperative robotic system for upper-limb rehabilitation in working environments. (Project funded by INAIL).

- Role in the project: Project Manager and Work package Responsible. Francesca Cordella contributed in writing the project proposal. She worked on the design of a modular architecture for the multimodal interface and on the development of the robot control strategy

February 2015–July 2018: **AIDE** – Adaptive Multimodal Interfaces to Assist Disabled People in Daily Activities (European Project H2020).

- Role in the project: Task responsible. Francesca Cordella worked on the development and evaluation of user interfaces easily adaptable to subjects with different levels of disability in the framework of assistive robotics

May 2014–June 2017: **PPR2** – Control of upper limb prostheses with invasive neural interfaces. (Project funded by INAIL).

- Role in the project: Tasks responsible. Francesca Cordella contributed in writing the project proposal. She contributed in the definition of the requirements and characteristics of a prosthetic system, in the biomechanical analysis of the grasping action, in the design and development of a low-level control strategy for the prosthetic hand

November 2013–November 2014: **HandBot** – Protesi di mano biomeccatroniche dotate di percezione tattile bioispirata, interfacce neurali bi-direzionali e controllo sensori-motorio distribuito (National Project PRIN).

- Role in the project: Research and Development as Post Doc Francesca Cordella worked in the development, implementation and experimental validation of a grasp synthesis algorithm for an anthropomorphic robotic arm-hand system in a low dimensional posture subspace

June 2012 – June 2013: **ROCOCÒ** – COoperative and COllaborative RObotics (National Project PRIN).

- Role in the project: Research and Development as Post Doc. Francesca Cordella worked on the development of vision-based strategies for arm-hand pose estimation for safe human-robot interaction and robot-aided rehabilitation.

March 2008 – December 2012: **DEXMART project** – DEXterous and autonomous dual-arm/hand robotic manipulation with sMART sensory-motor skills: A bridge from natural to artificial cognition (European research project EU FP7)

- Role in the project: Research and Development as PhD student. Francesca Cordella worked on the development of bio-inspired grasping algorithms for anthropomorphic robotic hands.

Awards

- Third place at the 2017 IEEE Robotics and Automation video contest - Italian Chapter with the video entitled “Playing piano by demonstration". Authors: C. Lauretti, F. Cordella, D. Simonetti
- Winner of the Premio Qualità 2020, Campus Bio-Medico University of Rome with a project on the improvement in the field of quality and clinical risk. Authors: C. Tamantini, F. Scotto di Luzio, F. Cordella, G. Pascarella, F. Agró, L. Zollo

Commission of Trust

June 2024 – present	Co-chair of the IEEE RAS Technical Committee on Rehabilitation and Assistive Robotics
2023 – present	Member of Evaluation Board for “IEEE RAS Italian Chapter “Fabrizio Flacco” Young Author Best Paper Award”
2020 – present	Doctoral Thesis Jury Member: 1 PhD thesis in , Universidad Miguel Hernandez de Elche (Spain); 2 PhD thesis in Biorobotics, Scuola Superiore Sant’Anna (Italy); 1 Ph.D. degree of the University of Malta;
2019 – 2022	Member of the Evaluation Board for the Best MSc and PhD Thesis Award from the Gruppo Nazionale di Bioingegneria
2021	Member of the Evaluation Board for the Discovery Grant Program for the Natural Sciences and Engineering Research Council of Canada (NSERC)
2021	External Reviewer for the VQR 2015-2019
2020	Member of the Evaluation Board for the Erwin Schroedinger Fellowship for the Austrian Science Fund (FWF)
2018	Member of the Evaluation Board for the Best Thesis Award of the 2018 French Robotic Research Network (CNRS)
2017	Member of the Evaluation Board for the Best Thesis Award of GDR Robotique

March 2017	Expert Reviewer of European Projects Horizon H2020 for the European Commission in the framework of Personalised coaching for well-being and care of people as they age.
June 2015	Expert Reviewer of European Projects Horizon H2020 for the European Commission in the framework of ICT for active and healthy ageing.

Invited talks

20 October 2023	"Sensory feedback in closed-loop devices" in the framework of the workshop "Ongoing research on motion control and sensory feedback restoration in bionics" of the 5th Italian Conference of Robotics and Intelligent Machines
21 October 2023	"The role of perception in healthcare robotics" in the framework of the workshop "Perception Unleashed: Achieving Safety, Efficiency, and Awareness in Human-Robot Collaboration" of the 5th Italian Conference of Robotics and Intelligent Machines
22 March 2023	"The centrality of the person in biomedical technologies" in the framework of the workshop "Robotics between engineering and medicine", Università Campus Bio-Medico di Roma
6 September 2022	"User-centred rehabilitation and assistive robotics" University College London, London, UK
10 October 2022	"Feedback strategies in working and assistive environments" R4-Robotique
16 September 2021	"Human-Robot shared control in biomedical applications" in the framework of the conference "BioTechMeet2021 – International meet on Biotechnology and Bioengineering", Porto, Portugal
22 April 2021	"Nuove frontiere della robotica in campo medico", in the framework of the event “gURLSs! Who codes the world?"
25 October 2020	Human-Robot shared control in surgical and assistive applications, Workshop “Autonomous System in Medicine: Current Challenges in Design, Modeling, Perception, Control and Applications" in the framework of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).
30 October 2020	“Indici strumentali robotici", Corso FAD SIAMOC - La robotica riabilitativa: le sfide per un trattamento personalizzato
7 February 2020	The Safe-Mover Project: a user-centred approach, PhD Course “Personalized Medicine and Healthcare 4.0", Campus Bio-Medico University of Rome.
29 November 2019	Nuove frontiere della robotica in campo medico, Conference “Ordine Ingegneri Sapienza", Rome.
19 October 2019	Multimodal interfaces for upper-limb rehabilitation robotics: A bio-cooperative approach, Workshop “Robotics in rehabilitation: main challenges for a tailored treatment", Convegno Istituto di Robotica e Macchine Intelligenti, Rome.
9 March 2019	Robotic technologies for biomedical applications, Conference “Politica Sanitaria e Tecnologia", Potenza.
14 December 2018	New approaches for the rehabilitation of the working gesture, Training course “Adeguamento e adattamento delle postazioni di lavoro per il reinserimento di persone con disabilità da lavoro", Rome
30 November 2018	Robotic technologies for biomedical applications, Conference “Medicina e salute: robotica in medicina", Rome.
2017	Assistive technologies, National Conference Scienza & Vita, Rome.
2007	Simulators for laparoscopic surgery – State of the art, Internal Seminar – Città della scienza, Naples

Personal skills and competences

Programming in:

- C
- C++
- Matlab and Simulink
- Assembly (Motorola 68x family)
- Basic knowledge of SQL
- Comsol Multiphysics
- Solidworks
- OpenCV
- Libfreenect
- OpenNI
- Robot Operating System (ROS)
- Yet Another Robotic Platform (YARP)
- NAOqi e Choreographe (Sofware for working with the NAO-Aldebaran robot)
- Fast Research Interface (Library for controlling the Light Weight Robot-KUKA)
- SW for the management of motion analysis systems: Vicon Nexus, Vicon IQ, SMART for BTS

Participation in drafting of European Projects, PON, FIRB, PRIN

Conference, PhD School and Workshop Organizer

5-11 September 2024	Member of the Organizing Committee of the PhD summer School on Robotics and Intelligent Machines (2nd Edition) - DRIMS2, Volterra, Italy
9-12 October 2024	Member of the Local Organizing Committee and Worskhop Chair for the 6th Conference on Robotics and Machine intelligent (I-RIM3D), Rome, Italy
8-10 October 2021	Member of the Organizing Committee for the 3rd Conference on Robotics and Machine intelligent (I-RIM3D), Rome, Italy
14-18 June 2021	Workshop Chair of the Seasonal School on Rehabilitation and Assistive Technologies based on Soft Robotics (SoftTech-Rehab), online
11 October 2024	Organizer of the Workshop "Bringing Robotics in Ph.D. Summer Schools – Offer and approaches", in the framework of the 6th Conference on Robotics and Machine intelligent (I-RIM3D), Rome, Italy
October 2023	Organizer of the Workshop “Ongoing research on motion control and sensory feedback restoration in bionics", in the framework of the 5th Conference on Robotics and Machine intelligent (I-RIM3D), Rome, Italy
May 2022	Organizer of the Workshop “Human-in-the loop paradigm for assistive robotics", in the framework of the IEEE International Conference on Robotics and Automation, Philadelphia, USA, May 2022
13 November 2021	Organizer of the Workshop “ASIMOV - Adaptive Social Interaction and MOVement for assistive and rehabilitation robotics" in the framework of the 13th International Conference on Social Robotics, Singapoour
4 September 2020	Organizer of the 4th Workshop on "Behavior Adaptation, Interaction and Learning for Assistive Robotics – BAILAR" in the framework of 29th IEEE International Conference on Robot and Human Interactive Communication, Naples

10 December 2020

Organizer of the Workshop “Two decades of rehabilitation and assistive robotics: lessons learned and future challenges" in the framework of the 2nd Conference on Robotics and Machine intelligent I-RIM 2020

26 August 2018

Organizer of the Workshop “Assistive user interfaces and control strategies for adaptive human-robot interaction" in the framework of the 7th IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics, Enschede

Journal and Conference service

Lead Guest Editor of Special Issue

- "Human-Centered Artificial Intelligence in Interaction Processes" for the Journal Frontiers in Artificial Intelligence, 2024 (Topic Editors: Maria Chiara Caschera, Patrizia Grifoni, Francesca Cordella)
- "Recent Advances in Medical Robotics" for the Journal Machines, 2024 (Guest Editors: Clemente Lauretti, Alessia Noccaro, Francesca Cordella)
- "Computational Control in Neurorobotics" for the Journal Robotics, 2024 (Guest Editors: Francesca Cordella, Mattia Stefano)
- "Artificial Intelligence and Intelligent Robots: Challenges and Opportunities" for the Journal Applied Sciences, 2024 (Guest Editors: Christian Tamantini, Andrea Orlandini, Francesca Cordella)
- "Research Advances in Rehabilitation and Exoskeleton Robotics" for the Journal Bioengineering, 2024 (Guest Editors: Nicolas Garcia-Aracil, Andrea Blanco, Josè Maria Catalàn, Francesca Cordella)
- “Challenges and Future Trends of Wearable Robotics - Volume II" for the Journal “Sensors", 2023 (Guest Editors: Francesca Cordella, Emilio Trigili, Jan Babic)
- “Challenges and Future Trends of Wearable Robotics" for the Journal “Sensors", 2022 (Guest Editors: Francesca Cordella, Emilio Trigili, Jan Babic)
- “Neurorobotics and strategies for adaptive human-machine interaction – Volume II" for the Journal “Frontiers in Neurorobotics", 2022 (Guest Editors: Francesca Cordella, Surjo Soekadar, Loredana Zollo)
- “Neurorobotics and strategies for adaptive human-machine interaction" for the Journal “Frontiers in Neurorobotics", 2020 (Guest Editors: Francesca Cordella, Surjo Soekadar, Loredana Zollo)
- “Analysis of Human Behavior for Robot Design and Control" for the Journal “Applied Bionics and Biomechanics", 2019 (Guest Editors: Francesca Cordella, Michelle Johnson, Loredana Zollo)

Scientific Committee Member

- VIII National Congress of Bioengineering, 21–23 June 2023, Padua, Italy

Technical Program Committee Member

- 5th International Electronics Communication Conference, Osaka, Japan, 2023
- 14th International Workshop on Human Friendly Robotics, Bologna (Italy), 2021
- 3rd International Electronics Communication Conference (IECC), Ho Chi Minh City, Vietnam, 2021.
- International Conference on Electronics, Communications and Control Engineering, Seoul, 2021
- IEEE MetroInd40& IoT, Rome, 2020.
- International Conference on Electronics, Communications and Control Engineering, Bali, 2020
- International Conference on Service Robotics Technologies, Singapur, 2020
- 12th International Workshop on Human Friendly Robotics, Reggio Emilia (Italy), 2019
- International Conference on Electronics, Communications and Control Engineering, Phuket, 2019
- International Conference on Service Robotics Technologies (ICSRT), Beijing (China), 2019
- International Conference on Service Robotics Technologies (ICSRT), Chengdu (China), 2018
- International Conference on Electronics, Communications and Control Engineering, Maldives, 2018
- 5th Int. Workshop on Assistive Computer Vision and Robotics, Venice (Italy), 2017
- 1st Int. Workshop on Behaviors Adaptation, Interaction and Learning for Assistive Robotics, New York City (USA), 2016
- 4th Int. Workshop on Assistive Computer Vision and Robotics, Amsterdam (The Netherlands), 2016
- 3rd Int. Workshop on Assistive Computer Vision and Robotics, Chile, 2015
- 2nd Int. Workshop on Assistive Computer Vision and Robotics, Zurich, 2014

Editorial Board Member

- Associate Editor for IEEE International Conference on Robotics and Automation (ICRA) 2025, Atlanta (USA)
- Associate Editor for IEEE International Conference on Robot and Human Interactive Communication (RO-MAN) 2024, Pasadena (USA)
- Associate Editor for IEEE International Conference on Robotics and Automation (ICRA) 2024, Yokohama (Japan)
- Associate Editor for IEEE International Conference on Robot and Human Interactive Communication (RO-MAN) 2023, Busan (Korea)
- Associate Editor for IEEE International Conference on Robot and Human Interactive Communication (RO-MAN) 2022, Naples (Italy)

- Associate Editor for IEEE International Conference on Robot and Human Interactive Communication (RO-MAN) 2021, virtual event
- Associate Editor for IEEE RAS/EMBS International Conference for Biomedical Robotics and Biomechatronics (BioRob) 2020, New York (USA)
- Associate Editor for IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2020, Las Vegas (USA)
- Associate Editor for the journal Journal of Biomedical Science & Applications, 2017 — 2019
- Associate Editor for the journal Applied Bionics and Biomechanics, 2020 - present

Speaker in Conference sessions

- May, 2022 — IEEE International Conference on Robotics and Automation, Philadelphia, USA;
- August, 2018 — IEEE International Conference on Biomedical Robotics and Biomechatronics, Enschede, The Nederlands;
- June, 2018 — V Congresso Gruppo Nazionale di Bioingegneria, Milan;
- July, 2017 — IEEE International Conference on Rehabilitation Robotics, London;
- June, 2016 — IEEE International Conference on Robotics and Automation, Stocholm;
- June, 2016 — V Congresso Gruppo Nazionale di Bioingegneria, Naples;
- August 2014 — IEEE International Conference on Biomedical Robotics and Biomechatronics, Sao Paulo, Brasil;
- June, 2014 — IV Congresso Gruppo Nazionale di Bioingegneria, Pavia;
- June 2012 — IEEE International Conference on Biomedical Robotics and Biomechatronics, Rome;
- October 2010 — ViRtual environments and prototyping for huMAN health and safety, special track of 9th International Conference IDMME – Virtual Concept, Bordeaux, France;
- October 2010 — 1th International Conference on Applied Bionics and Biomechanics, Venice.

Reviewer for International Journals

IEEE Transactions on Biomedical Engineering, IEEE Access, IEEE Transactions on Systems, Man and Cybernetics, Part B; IEEE Robotics and Automation Magazine; IEEE Transactions on measurements; IEEE Transactions on Cybernetics; International Journal of Advanced Robotic Systems; Journal of Intelligent and Robotic Systems; IEEE Robotics and Automation Letters; Pattern Recognition Letters; Applied Bionics and Biomechanics; Journal of Medical Robotics Research; Medical Engineering & Physics; Robotics and Computer Integrated Manufacturing; Journal of Medical and Biological Engineering; Journal of Motor Behavior; PlosOne; Journal of Healthcare Engineering; IEEE Transactions on Human-Machine Systems; Sensors; IEEE Sensors Journal; Frontiers in Neurorobotics; Humanoids; Journal of Engineering in medicine; Journal of Healthcare Engineering; Journal of Medical Robotics Research; IEEE Transactions on Automation Science and Engineering; Artificial Organs; Biocybernetics and Biomedical Engineering; Disability and Rehabilitation; Frontiers in Robotics and Artificial Intelligence; IEEE Transactions on Automation Science and Engineering; IEEE Transactions on Medical Robotics and Bionics; Neurorehabilitation and Neural Repair

Reviewer for International Conferences

IEEE International Conference on Biomedical Robotics and Biomechatronics; International Conference of the IEEE Engineering in Medicine and Biology Society; IEEE International Conference on Robotics and Automation; IEEE International Symposium on Robot and Human Interactive Communication; IEEE International Conference on Automation Science and Engineering; IEEE/RAS-EMBS International Conference on Rehabilitation Robotics; IEEE/RSJ International Conference on Intelligent Robots and Systems; International Conference on Informatics in Control, Automation and Robotics; IFAC Symposium on Robot Control; Congress of the International Federation of Automatic Control; International Symposium Measurement of Electrical Quantities; International Workshop on Assistive Computer Vision and Robotics; International Workshop on Behaviors Adaptation, Interaction and Learning for Assistive Robotics, International Conference on Service Robotics Technologies, International Conference on Electronics, Communications and Control Engineering; IEEE International Symposium on Medical Robotics

Member of Scientific societies

From 2008 Francesca Cordella is member of the IEEE and of the IEEE Robotics and Automation Society. She is Co-Chair of the IEEE/RAS Technical Committee (TC) on Rehabilitation and Assistive Robotics. She is founder member of i) the National Group of Bioengineering (GNB), ii) the Istituto di Robotica e Macchine Intelligenti (I-RIM), iii) the International Consortium On Rehabilitation Robotics (ICORR). She is member of the Società Italiana di Analisi del Movimento in Clinica (SIAMOC).

Mother tongue **Italian**

Other language English

Self-assessment
European level(*)

Understanding		Speaking		Writing
Listening	Reading	Spoken interaction	Spoken production	
English				
C1 Proficient user	C1 Proficient user	C1 Proficient user	C1 Proficient user	C1 Proficient user

(*) *Common European Framework of Reference* (CEF) level

Publications

International Journal Papers

[J63] J. Follmann, J., C. Gentile, F. Cordella, L. Zollo, C.R. Rodrigues, "Touch and slippage detection in robotic hands with spiking neural networks", Engineering Applications of Artificial Intelligence, 136, 108953, 2024

[J62] C. Tamantini, F. Cordella, N.L. Tagliamonte, I. Pecoraro, I. Pisotta, A. Bigioni, F. Tamburella, M. Lorusso, M. Molinari, L. Zollo, "A Data-Driven Fuzzy Logic Method for Psychophysiological Assessment: An Application to Exoskeleton-Assisted Walking," IEEE Transactions on Medical Robotics and Bionics, vol. 6, no. 2, pp. 695-705, 2024

[J61] F. Mereu, F. Cordella, R. Paolini, A. Scarpelli, A. Demofonti, L. Zollo, E. Gruppioni, "A Sensory Feedback Neural Stimulator Prototype for Both Implantable and Wearable Applications", Micromachines, 15, 480, 2024

[J60] S. Ligioi, G. Loianno, F. Cordella, "Robust Upper Limb Kinematic Reconstruction Using a RGB-D Camera", IEEE Robotics and Automation Letters, 9(4), pp. 3831–3837, 2024

[J59] A. Scarpelli, A. Demofonti, F. Cordella, U. Coffa, F. Mereu, E. Gruppioni, L. Zollo, "Eliciting Force and Slippage in Upper Limb Amputees Through Transcutaneous Electrical Nerve Stimulation (TENS)", IEEE Transactions on Neural Systems and Rehabilitation Engineering, 32:3006-3017, 2024

[J58] E. Stefanelli, M. Sperduti, F. Cordella, N.L. Tagliamonte, L. Zollo, "Performance Assessment of Thermal Sensors for Hand Prostheses" IEEE Sensors Journal, 24(17), pp. 27559–27569, 2024

[J57] M. Lapresa, V. Corradini, A. Iacca, F. Scotto di Luzio, L. Zollo,F. Cordella, "A comprehensive analysis of task-specific hand kinematic, muscle and force synergies", Biocybernetics and Biomedical Engineering 44 (1), 218-230, 2024

[J56] M. Lapresa, E. Guglielmelli, L. Zollo, F. Cordella, "A marker-based approach to determine the centers of rotation of finger joints", Computer Methods and Programs in Biomedicine, 108055, 2024

[J55] M. Sguanci, S. Mancin, M. Piredda, F. Cordella, N.L. Tagliamonte, L. Zollo, M.G. De Marinis, "Nursing-engineering interdisciplinary research: A synthesis of methodological approach to perform healthcare-technology integrated projects", MethodsX, 102525, 2024

[J54] G. Cirelli, C. Tamantini, L.P. Cordella, F. Cordella, "A Semiautonomous Control Strategy Based on Computer Vision for a Hand–Wrist Prosthesis", Robotics 12 (6), 152, 2023

[J53] F. Cordella, S.R. Soekadar, L. Zollo, "Editorial: Neurorobotics and strategies for adaptive human-machine interaction, volume II", Frontiers in Neurorobotics, 17:1354389, 2023

[J52] T. Varrecchia, G. Chini, S. Di Fonzo, R. Billardello, C. Tamantini, F. Cordella, F. Scotto di Luzio, L. Zollo, L. Fiori, A. Tatarelli, A. Silvetti, M. Serrao, F. Draicchio, A. Ranavolo, "valuation of a passive upper limb exoskeleton using high-density surface electromyography", Gait & Posture 105, S52-S53, 2023

[J51] R. Billardello, C. Tamantini, F. Scotto di Luzio, F. Cordella, F. Russo, G. Papalia, G. Vadalà, L. Zollo, "Quantifying muscular activity during Back Performance Scale tasks", Gait & Posture 105, S7-S8, 2023

[J50]] E. Stefanelli, F. Cordella, C. Gentile, L. Zollo, "Hand Prosthesis Sensorimotor Control Inspired by the Human Somatosensory System", Robotics 12 (5), 136, 2023

[J49] M. Lapresa, A. Ceccarelli, F. Taffoni, N.L. Tagliamonte, L. Zollo, F. Cordella, "Analysis of Hand Intra-Finger Couplings During Flexion Movements in the Free Space", IEEE Access, 2023

[J48] C. Tamantini*, F. Cordella*, C. Lauretti, F. Scotto Di Luzio, B. Campagnola, L. Cricenti, M. Bravi, F. Bressi, F. Draicchio, S. Sterzi, L. Zollo, "Tailoring upper-limb robot-aided orthopedic rehabilitation on patients' psychophysiological state", IEEE Transactions on Neural Systems and Rehabilitation Engineering, 2023

[J47] J.M. Vicente-Samper, C. Tamantini, E. Ávila-Navarro, M.Á. De La Casa-Lillo, L. Zollo, J.M. Sabater-Navarro, F. Cordella, "An ML-Based Approach to Reconstruct Heart Rate from PPG in Presence of Motion Artifacts", Biosensors 13(7), 718, 2023

[J46] R. Cittadini, C Tamantini, F Scotto di Luzio, C Lauretti, L Zollo, F. Cordella, "Affective state estimation based on Russell's model and physiological measurements", Scientific Reports 13 (1), 9786, 2023

[J45] M. Stefano, F. Cordella, G. Cozza, A.L. Ciancio, L. Zollo, "Study of electrical neural stimulation effects using extraneural and intraneural electrodes", Applied Sciences 13 (10), 2023

[J44] J.M. Catalán, E. Trigili, M. Nann, A. Blanco-Ivorra, C. Lauretti, F. Cordella, E. Ivorra, E. Armstrong, S. Crea, M. Alcañiz, L. Zollo, S.R. Soekadar, N. Vitiello, N. García-Aracil, "Hybrid brain/neural interface and autonomous vision-guided whole-arm exoskeleton control to perform activities of daily living (ADLs)", Journal of NeuroEngineering and Rehabilitation, 20, 61, 2023

[J43] R Collu, R Paolini, M Bilotta, A Demofonti, F. Cordella, L Zollo, M Barbaro, "Wearable High Voltage Compliant Current Stimulator for Restoring Sensory Feedback", Micromachines 14 (4), 782, 2023

[J42] F. Bressi, L. Cricenti, M. Bravi, F. Pannunzio, F. Cordella, M. Lapresa, S. Miccinilli, F. Santacaterina, L. Zollo, S. Sterzi, B. Campagnola, "Treatment of the Paretic Hand with a Robotic Glove Combined with Physiotherapy in a Patient Suffering from Traumatic Tetraparesis: A Case Report", Sensors 23 (7), 3484, 2023

[J41] F. Mereu, F. Morosato, F. Cordella, L. Zollo, E. Gruppioni "Exploring the EMG transient: the muscular activation sequences used as novel time-domain features for hand gestures classification", Frontiers in Neurorobotics, 17, 1264802, 2023

[J40] F. Leone, F. Mereu, C. Gentile, F. Cordella, E. Gruppioni, L. Zollo, "Hierarchical strategy for sEMG classification of the hand/wrist gestures and forces of transradial amputees", Frontiers in Neurorobotics, 2023

[J39] C. Lauretti, F. Cordella, I. Saltarelli, R. Morfino, L. Zollo, "A semi-autonomous robot control based on bone layer transition detection for a safe pedicle tapping", International Journal of Computer Assisted Radiology and Surgery, 1-11, 2023

[J38] C. Gentile, G. Lunghi, L.R. Buonocore, F. Cordella, M. Di Castro, A. Masi, L. Zollo, "Manipulation Tasks in Hazardous Environments Using a Teleoperated Robot: A Case Study at CERN", Sensors 23 (4), 1979, 2023

[J37] C. Tamantini, C. Rondoni, F. Cordella, E. Guglielmelli, L. Zollo, "A Classification Method for Workers' Physical Risk", Sensors 23 (3), 1575, 2023

[J36] M. Lapresa, C. Lauretti, F. Scotto di Luzio, F. Bressi, F. Santacaterina, M. Bravi, E. Guglielmelli, L. Zollo, F. Cordella, "Development and Validation of a System for the Assessment and Recovery of Grip Force Control", Bioengineering 10 (1), 63, 2023

[J35] A. Scarpelli, M. Stefano, F. Cordella, L. Zollo, "Evaluation of the effects of focused ultrasound stimulation on the central nervous system through a multiscale simulation approach", Frontiers in Bioengineering and Biotechnology, 2022, 10, 1034194

[J34] M. Lapresa, L. Zollo, F. Cordella, "A user-friendly automatic toolbox for hand kinematic analysis, clinical assessment and postural synergies extraction", Frontiers in Bioengineering and Biotechnology, 2022

[J33] F. Bressi, F. Santacaterina, L. Cricenti, B. Campagnola, F. Nasto, C. Assenza, D. Morelli, F. Cordella, M. Lapresa, L. Zollo, S. Sterzi, M. Bravi, "Robotic-Assisted Hand Therapy with Gloreha Sinfonia for the Improvement of Hand Function after Pediatric Stroke: A Case Report", Applied Sciences, 2022, 12(9), 4206

[J32] B. Albanesi, M. Piredda, M. Bravi, F. Bressi, R. Gualandi, A. Marchetti, G. Facchinetti, A. Ianni, F. Cordella, L. Zollo, M.G. De Marinis, "Interventions to prevent and reduce work-related musculoskeletal injuries and pain among healthcare professionals. A comprehensive systematic review of the literature", Journal of Safety Research, 2022, 82, pp. 124–143

[J31] F. Scotto di Luzio, F. Cordella, et al., "Modification of Hand Muscular Synergies in Stroke Patients after Robot-Aided Rehabilitation"; Applied Sciences 12 (6), 3146, 2022

[J30] C. Gentile, F. Cordella, L. Zollo, "Hierarchical Human-Inspired Control Strategies for Prosthetic Hands", Sensors 22 (7), 2521, 2022

[J29] F. Leone, C. Gentile, F. Cordella, E. Gruppioni, E. Guglielmelli, L. Zollo, "A parallel classification strategy to simultaneous control elbow, wrist, and hand movements", Journal of NeuroEngineering and Rehabilitation 19 (1), 1-17, 2022

[J28] C. Tamantini*, F. Cordella*, C. Lauretti, L. Zollo, "The WGD—A Dataset of Assembly Line Working Gestures for Ergonomic Analysis and Work-Related Injuries Prevention", Sensors, 2021, 21(22). DOI: 10.3390/s21227600. (*These authors contributed equally to this work)

[J27] T. Falcone, F. Cordella, V. Molinaro, L. Zollo, S. Del Ferraro, "Real-time human core temperature estimation methods and their application in the occupational field: a systematic review", Measurements:Journal of the International Measurement Confederation, 2021

[J26] F. Mereu*, F. Leone*, C. Gentile, F. Cordella, E. Gruppioni, L. Zollo, "Control strategies and performance assessment of upper-limb tmr prostheses: A review", Sensors, 2021, 21(6), pp. 1–31, 1953

[J25] M. Stefano, F. Cordella, A. Loppini, S. Filippi, L. Zollo, "A Multiscale Approach to Axon and Nerve Stimulation Modeling: A Review", IEEE Transactions on Neural Systems and Rehabilitation Engineering, 2021, 29, pp. 397–407, 9335942

[J24] F. Cordella, F. Scotto Di Luzio, M. Bravi, F. Santacaterina, F. Bressi, L. Zollo, "Hand motion analysis during robot-aided rehabilitation in chronic stroke", Journal of Biological Regulators and Homeostatic Agents, 2020, 34(5), pp. 45–52

[J23] M. Stefano, F. Cordella, E. Guglielmelli, L. Zollo, "Intraneural electrical stimulation of median nerve: A simulation study on sensory and motor fascicles", Journal of Biological Regulators and Homeostatic Agents, 2020, 34(5), pp. 127–136

[J22] C. Tamantini, F. Scotto di Luzio, F. Cordella, G. Pascarella, F.E. Agrò, L. Zollo, "A Robotic Healthcare Assistant for COVID-19 Emergency", IEEE Robotics and Automation Magazine, 2021.

[J21] M. Nann*, F. Cordella*, E. Trigili, C. Lauretti, M. Bravi, S. Miccinilli, J.M. Catalan, F.J. Badesa, S. Crea, F. Bressi, N. Garcia-Aracil, N. Vitiello, L. Zollo, S.R. Soekadar, "Restoring activities of daily living using an EEG/EOG-controlled semi-autonomous whole-arm exoskeleton in chronic stroke", IEEE Systems Journal, 2020(*These authors contributed equally to this work)

[J20] C. Gentile, F. Cordella, C. Ramos Rodriguez, L. Zollo, "Touch-and-slippage detection algorithm for prosthetic hands", Mechatronics, 2020

[J19] F. Cordella, L. Zollo, M. Johnson, “Editorial: Human behaviour analysis for robot design and control”, Applied Bionics and Biomechanics, 2020

[J18] C. Lauretti, F. Cordella, C. Tamantini, C. Gentile, F. Scotto di Luzio, L. Zollo, “A Surgeon-Robot Shared Control for Ergonomic Pedicle Screw Fixation”, IEEE Robotics and Automation Letters, 2020

[J17] F. Scotto di Luzio, C. Lauretti, F. Cordella, F. Draicchio, L. Zollo, “Visual vs Vibrotactile Feedback for Posture Assessment during Upper-Limb Robot-Aided Rehabilitation”, Applied Ergonomics, 2020

[J16] F.J. Badesa, J.A. Diez, M.J. Catalan, E. Trigili, F. Cordella, M. Nann, S. Crea, S.R. Soekadar, L. Zollo, N. Vitiello, N. Garcia-Aracil, “Physiological Responses During Hybrid BNCI Control of an Upper-Limb Exoskeleton”, Sensors, 2019, 19(22). pii: E4931. doi: 10.3390/s19224931

[J15] C. Lauretti, F. Cordella, L. Zollo, “A hybrid Joint/Cartesian DMP-based approach for obstacle avoidance of anthropomorphic assistive robots”, Journal of Social Robotics, vol. 11, no. 5, pp. 783—796, 2019. doi: 10.1007/s12369-019-00597-w

[J14] L. Zollo*, G. Di Pino*, A.L. Ciancio, F. Ranieri, F. Cordella, C. Gentile, E. Noce, R.A. Romeo, A. Dellacasa Bellingegni, G. Vadala, S. Miccinilli, A. Mioli, L. Diaz-Balzani, M. Bravi, K.P. Hoffmann, A. Schneider, L. Denaro, A. Davalli, E. Gruppioni, R. Sacchetti, S. Castellano, V. Di Lazzaro, S. Sterzi, V. Denaro, E. Guglielmelli, “Restoring tactile sensations via neural interfaces for real-time force-and-slippage closed-loop control of bionic hands”, Science Robotics, 2019, vol. 4, no. 27, eaau9924, DOI: 10.1126/scirobotics.aau9924

[J13] F. Scotto di Luzio, D. Simonetti, F. Cordella, S. Miccinilli, S. Sterzi, F. Draicchio, L. Zollo, “Bio-Cooperative Approach for the Human-in-the-Loop Control of an End-Effector Rehabilitation Robot”, Frontiers in Neurorobotics, 2018.

[J12] S. Crea*, M. Nann*, E. Trigili*, F. Cordella, A. Baldoni, F.J. Badesa, J.M. Catalán, L. Zollo, N. Vitiello, N. Garcia Aracil, S.R. Soekadar, “Feasibility and safety of shared EEG/EOG and vision-guided autonomous whole-arm exoskeleton control to perform activities of daily living”, Scientific Reports, vol. 8, no. 10823, 2018. DOI: 10.1038/s41598-018-29091-52018.

[J11] E. Noce, C. Gentile, F. Cordella, A.L. Ciancio, V. Piemonte, L. Zollo, “Grasp control of a prosthetic hand through peripheral neural signals”, Journal of Physics Conference Series, 2018. DOI: 10.1088/1742-6596/1026/1/012006

[J10] C. Lauretti, F. Cordella, A.L Ciancio, E. Trigili, J.M. Catalan, F.J. Badesa, S. Crea, S.M. Pagliara, S. Sterzi, N. Vitiello, N. Garcia Aracil, L. Zollo, “Learning-by-demonstration for motion planning of upper-limb exoskeletons”, Frontiers in NeuroRobotics, 2018

[J9] P. Pessia*, F. Cordella*, E. Schena, A. Davalli, R. Sacchetti, L. Zollo, “Evaluation of Pressure Capacitive Sensors for Application in Grasping and Manipulation Analysis”, Sensors, 2017 (*These authors contributed equally to this work).

[J8] F. Cordella, “Biomedical Engineering – the Strong Link between Medicine and Engineering”, Editorial: Journal of Biomedical Science & Applications, vol. 1 no. 1:2, 2017

[J7] A.G Cutti*, F. Cordella*, G. D’Amico, R. Sacchetti, A. Davalli, E. Guglielmelli, L. Zollo, “A motion analysis protocol for kinematic assessment of multifingered prosthetic hands with cosmetic gloves”, Artificial Organs, 2017 (*These authors contributed equally to this work)

[J6] F. Cordella, F. Di Corato, B. Siciliano, L. Zollo, “A stochastic algorithm for automatic hand pose and motion estimation”, Medical & Biological Engineering & Computing, 2017

[J5] C. Lauretti, F. Cordella, E. Guglielmelli, L. Zollo, “Learning by Demonstration for planning activities of daily living in rehabilitation and assistive robotics”, Robotics and Automation Letters, 2017

[J4] F. Cordella, A.L. Ciancio, R. Sacchetti, A. Davalli, A.G. Cutti, E. Guglielmelli, L. Zollo, “Literature review on needs of upper limb prosthesis users”, Frontiers in Neuroscience, vol. 10, 2016. doi: 10.3389/fnins.2016.00209

[J3] A.L. Ciancio, F. Cordella, R. Barone, R.A. Romeo, A. Dellacasa Bellingegni, R. Sacchetti, A. Davalli, G. Di Pino, F. Ranieri, V. Di Lazzaro, E. Guglielmelli, L. Zollo, “Control of prosthetic hands via the peripheral nervous system”, Frontiers in Neuroscience, vol. 10, 2016. doi: 10.3389/fnins.2016.00116

[J2] F. Cordella, L. Zollo, E. Guglielmelli, B. Siciliano, “Human hand motion analysis and synthesis of optimal power grasps for a robotic hand”, International Journal of Advanced Robotic Systems, 2014

[J1] F. Cordella, L. Zollo, E. Guglielmelli, B. Siciliano, “A bio-inspired grasp optimization algorithm for an anthropomorphic robotic hand”, International Journal of Interactive Design and Manufacturing, 2012

Book Chapters

[B6] R. Collu, A. Mascia, R. Paolini, F. Cordella, L. Zollo, P. Cosseddu, M. Barbaro, "A Microcontroller-Based Portable Transcutaneous Electrical Nerve Stimulator via Ultracomfortable Tattoo Electrodes for Haptic Feedback". In: Ciofi, C., Limiti, E. (eds) Proceedings of SIE 2023. Lecture Notes in Electrical Engineering, vol 1113. Springer, Cham, 2023

[B5] F. Cordella, A.L. Ciancio, L. Zollo, “Robot-assisted post-surgery rehabilitation”, XXXVIII Bioengineering School in Advanced bioengineering methods, technologies and tools in surgery and therapy, Patron Editore, 2019

[B4] F. Scotto Di Luzio, F. Cordella, C. Lauretti, F. Draicchio, L. Zollo, “Assessment of muscular activation patterns in 3d upper limb robot-aided rehabilitation”, Biosystems and Biorobotics, vol. 21, pp. 349–353, 2019

[B3] A.L. Ciancio, F. Cordella, K.P. Hoffmann, A. Schneider, E. Guglielmelli, L. Zollo, “Current achievements and future directions of hand prostheses controlled via peripheral nervous system”, In: Bertolaso M., Di Stefano N. (eds) The Hand. Studies in Applied Philosophy, Epistemology and Rational Ethics, vol 38, 2017. Springer, Cham. doi: 10.1007/978-3-319-66881-9-5

[B2] F. Cordella, F. Di Corato, L. Zollo, B. Siciliano, “A robust hand pose estimation algorithm for hand rehabilitation", New Trends in Image Analysis and Processing – ICIAP 2013 Lecture Notes in Computer Science, vol. 8158, pp. 1–10, A. Petrosino, L. Maddalena, P. Pala (eds.), Springer Verlag Berlin Heidelberg, 2013.

[B1] F. Cordella, L. Zollo, A. Salerno, E. Guglielmelli, B. Siciliano, “Validation of a power grasping algorithm for an anthropomorphic robotic hand on the basis of human grasping action”, Latest Advances in Robot Kinematics, pp. 91–98, J. Lenarcic M. Husty Editori, Springer, 2012. 10.1007/978-94-007-4620-6-12

International Conference Papers

[C36] J. Follmann, C. Gentile, F. Cordella, L. Zollo, C.R. Rodrigues, C.R., IFMBE Proceedings, 100, pp. 111–122, 2024

[C35] R. Collu, A. Mascia, R. Paolini, F. Cordella, L. Zollo, P. Cosseddu, M. Barbaro, "A Microcontroller-Based Portable Transcutaneous Electrical Nerve Stimulator via Ultracomfortable Tattoo Electrodes for Haptic Feedback", Annual Meeting of the Italian Electronics Society, 385-395, 2023

[C34] C. Tamantini*, F. Cordella*, C. Lauretti, F. Scotto di Luzio, M. Bravi, F. Bressi, F. Draicchio, S. Sterzi, L. Zollo, "Patient-tailored Adaptive Control for Robot-aided Orthopaedic Rehabilitation", Proceedings - IEEE International Conference on Robotics and Automation, 2022 (*These authors contributed equally to this work)

[C33] A. Scarpelli, M. Stefano, F. Cordella, L. Zollo, "Multiscale approach for tFUS neurocomputational modelling", 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society, 2022

[C32] A. Demofonti, A. Scarpelli, F. Cordella, L. Zollo, "Modulation of Sensation Intensity in the Lower Limb Via Transcutaneous Electrical Nerve Stimulation", 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), 31 October - 4 November, 2021.

[C31] C. Tamantini, M. Lapresa, F. Scotto di Luzio, F. Cordella, L. Zollo, "Analysis of Physiological Parameters and Workload during Working Tasks in COVID-19 Pandemic Conditions", IEEE International Workshop on Metrology for Industry 4.0 & IoT, 2021

[C30] M. Stefano, F. Cordella, S.M. Li Gioi, L. Zollo, "Electrical stimulation of the human median nerve: A comparison between anatomical and simplified simulation models", International IEEE/EMBS Conference on Neural Engineering, NER, 2021, 2021-May, pp. 769–772, 9441187

[C29] I. Pecoraro, N.L. Tagliamonte, C. Tamantini, F. Cordella, F. Bentivoglio, I. Pisotta, A. Bigioni, F. Tamburella, M. Lorusso, P. Argentieri, M. Molinari L. Zollo, “Psychophysiological assessment of exoskeleton-assisted treadmill walking", 5th International Conference on NeuroRehabilitation, 2021.

[C28] C. Tamantini, M. Lapresa, F. Cordella, F. Scotto di Luzio, C. Lauretti, L. Zollo, “A robot-aided rehabilitation platform for occupational therapy with real objects", 5th International Conference on NeuroRehabilitation, 2021.

[C27] M. Stefano, F. Cordella, L. Zollo, “The intraneural electrical stimulation of human median nerve: A simulation study", 29th IEEE International Conference on Robot and Human Interactive Communication, RO-MAN 2020, 2020, pp. 671–676, 9223448

[C26] M. Lapresa, C. Tamantini, F. Scotto Di Luzio, F. Cordella, S. Miccinilli, F. Bressi, L. Zollo, “A Smart Solution for Proprioceptive Rehabilitation through M-IMU Sensors", 2020 IEEE International Workshop on Metrology for Industry 4.0 and IoT, 2020, pp. 591–595, 9138193

[C25] A. Lanata, A. Greco, S. Di Modica, C. Tamantini, F. Cordella, L. Zollo, M. Di Sarto, E.P. Scilingo, “A New Smart-Fabric based Body Area Sensor Network for Work Risk Assessment", 2020 IEEE International Workshop on Metrology for Industry 4.0 and IoT, MetroInd 4.0 and IoT 2020 - Proceedings, 2020, pp. 187–190, 9138273

[C24] C. Tamantini, C. Lauretti, F. Cordella, F. Draicchio, L. Zollo, “A Dataset of DMPs for robot motion planning", Gruppo Nazionale Bioingegneria, 2020.

[C23] M.Stefano, A.Scarpelli, F.Cordella, L.Zollo, “A simulation study on safety and efficacy of tFUS", Gruppo Nazionale Bioingegneria, 2020.

[C22] A. Demofonti, A. Scarpelli, V. Iannelli, A.L. Ciancio, F. Cordella, L. Zollo, “Somatotopical feedback restoration in the lower limb through TENS", Gruppo Nazionale Bioingegneria, 2020.

[C21] F. Cordella, F. Scotto Di Luzio, c. Lauretti, F. Draicchio, L. Zollo, “A biofeedback-based posture correction system for working environments”, IEEE International Workshop on Metrology for Industry 4.0 and IoT, 2019.

[C20] F. Scotto di Luzio, D. Simonetti, F. Cordella, G. Carpino, F. Draicchio, L. Zollo, “An adaptive arm-weight support platform for 3D upper limb robot-aided neurorehabilitation”, IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics, 2018. DOI: 10.1109/BIOROB.2018.8487738

[C19] F. Scotto di Luzio, F. Cordella, C. Lauretti, F. Draicchio, L. Zollo, “Assessment of muscular activation patterns in 3D upper limb robot-aided rehabilitation”, International Conference on NeuroRehabilitation, 2018. DOI: 10.1007/978-3-030-01845-0-70

[C18] F. Scotto di Luzio, F. Cordella, C. Lauretti, D. Simonetti, S. Sterzi, F. Draicchio, L. Zollo, “A bio-cooperative robotic system to ensure ergonomic postures during upper limb rehabilitation in occupational contexts”, 20th Congress of the International Ergonomics Association, 2018. DOI: 10.1007/978-3-319-96065-4-37

[C17] E. Noce, C. Gentile, F. Cordella, A.L. Ciancio, V. Piemonte, L. Zollo, “Grasp control of a prosthetic hand through peripheral neural signals”, International Conference on Electronics, Communications and Control Engineering, Avid College, Maldives March 6-8, 2018.

[C16] A. Noccaro, F. Cordella, L. Zollo, G. Di Pino, E. Guglielmelli, D. Formica, “A teleoperated control approach for anthropomorphic manipulator using magneto-inertial sensors”, 26th International Symposium on Robot and Human Interactive Communication, 2017

[C15] C. Lauretti, F. Cordella, F. Scotto di Luzio, S. Saccucci, L. Zollo, “Comparative Performance Analysis of M-IMU/EMG and Voice User Interfaces for Assistive Robots”, IEEE Conference on Rehabilitation Robotics, 2017.

[C14] R.A. Romeo, F. Cordella, A. Davalli, R. Sacchetti, E. Guglielmelli, L. Zollo, “An instrumented object for studying human grasping”, IEEE Conference on Rehabilitation Robotics, 2017.

[C13] F. Cordella, C. Gentile, L. Zollo, R. Barone, R. Sacchetti, A. Davalli, B. Siciliano, E. Guglielmelli, “A force-and-slippage control strategy for a poliarticulated prosthetic hand”, IEEE International Conference on Robotics and Automation, pp. 3524–3529, 2016. doi:10.1109/ICRA.2016.7487533

[C12] F. Cordella, F. Taffoni, L. Raiano, G. Carpino, M. Pantoni, L. Zollo, E. Schena, E. Guglielmelli, D. Formica, “Design and development of a sensorized cylindrical object for grasping assessment”, International Conference of the IEEE Engineering in Medicine and Biology Society, pp. 3366–3369, 2016. doi:10.1109/EMBC.2016.7591449

[C11] R.A. Romeo, F. Cordella, L. Zollo, D. Formica, P. Saccomandi, E. Schena, G. Carpino, A. Davalli, R. Sacchetti, E. Guglielmelli, “Development and Preliminary Testing of an Instrumented Object for Force Analysis during Grasping”, International Conference of the IEEE Engineering in Medicine and Biology Society, pp. 6720–6723, 2015.doi: 10.1109/EMBC.2015.7319935

[C10] F. Cordella, L. Zollo, E. Guglielmelli, “A RGB-D Camera-Based Approach for Robot Arm-Hand Teleoperated Control", 20th IMEKO TC-4 International Symposium Measurement of Electrical Quantities, Special Session on Transducers for robot autonomous navigation, 2014.

[C9] A. Provenzale, F. Cordella, L. Zollo, A. Davalli, R. Sacchetti, E. Guglielmelli, “A grasp synthesis algorithm based on postural synergies for an anthropomorphic arm-hand robotic system", IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics, 2014.

[C8] F. Cordella, F. Di Corato, L. Zollo, B. Siciliano, “Pose estimation algorithm for hand assessment", 6th International IEEE EMBS Conference on Neural Engineering, pp. 1598–1601, 2013, San Diego, CA, USA.

[C7] F. Cordella, F. Di Corato, L. Zollo, B. Siciliano, “A robust hand pose estimation algorithm for hand rehabilitation”, First International Workshop on Assistive Computer Vision and Robotics, 2013.

[C6] F. Cordella, F. Di Corato, G. Loianno, B. Siciliano, L. Zollo, “Robust Pose Estimation Algorithm for Wrist Motion Tracking”, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), pp. 3746–3751, 2013.

[C5] F. Cordella, F. Di Corato, L. Zollo, B. Siciliano, P. van der Smagt, “Patient performance evaluation using Kinect and Monte Carlo-based finger tracking”, IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics, 2012

[C4] F. Cordella, L. Zollo, A. Salerno, E. Guglielmelli, B. Siciliano, “Validation of a power grasping algorithm for an anthropomorphic robotic hand on the basis of human grasping action”, Advances in Robot Kinematics, 2012.

[C3] F. Cordella, L. Zollo, A. Salerno, E. Guglielmelli, B. Siciliano, “Experimental validation of a reach-and-grasp optimization algorithm inspired to human arm-hand control” , IEEE International Conference on Engineering in Medicine and Biology Society, 2011.

[C2] F. Cordella, L. Zollo, E. Guglielmelli, B. Siciliano, “An approach for optimal grasp determination and finger trajectory planning of a robotic hand by imitating human behavior”, 1th International Conference on Applied Bionics and Biomechanics, 2010.

[C1] F. Cordella, L. Zollo, E. Guglielmelli, B. Siciliano, “A bio-inspired strategy for optimal grasp of an anthropomorphic robotic hand”, ViRtual environments and prototyping for huMAN health and safety, special track of 9th International Conference IDMME – Virtual Concept, 2010.

National Conference Papers

[NC12] C. Lauretti, F. Cordella, I. Saltarelli, L. Zollo, "A safe robot control for semi-autonomous pedicle tapping", Convegno Nazionale di Bioingegneria (GNB), 21 - 23 June 2023

[NC11] M.Lapresa, E.M. Romano, L. Zollo, F. Cordella, Performance Evaluation of the Gloreha Sinfonia Device in Bimanual Modality, VIII Congress of the National Group of Bioengineering (GNB), 21 - 23 June 2023

[NC10] R. Billardello, F. Cordella, F. Leone, F. Mereu, E. Gruppioni, L. Zollo, Comparative Analysis of EMG-based classifiers for recognizing hand/wrist gestures and forces, VIII Congress of the National Group of Bioengineering (GNB), 21 - 23 June 2023

[NC9] C. Tamantini, F. Scotto di Luzio, F. Cordella, M. Lapresa, G. Pascarella, F.E. Agr’ø, L. Zollo, “A Robotic Assistant for Logistics and Disinfection in Health Centers", I-RIM Conference, 2020.

[NC8] C. Tamantini, M. Lapresa, F. Cordella, F. Scotto di Luzio, C. Lauretti, L. Zollo, “Combined use of DMP and real objects in robot-aided rehabilitation", I-RIM Conference, 2020.

[NC7] I. Pecoraro, N.L. Tagliamonte, C. Tamantini, F. Cordella, F. Bentivoglio, I. Pisotta, A. Bigioni, F. Tamburella, M. Lorusso, P. Argentieri, M. Molinari, L. Zollo, “Assessment of the psychophysiological state during walking with a treadmill-based exoskeleton", I-RIM Conference, 2020.

[NC6] C. Gentile, F. Cordella, L. Zollo, “A novel strategy to detect and control force and slippage in prosthetic hands", VI Congresso Nazionale di Bioingegneria, Milan, June 25-27, 2018.

[NC5] F. Cordella, C. Lauretti, F. Scotto Di Luzio, S. Saccucci, L. Zollo, “A robust and intuitive M-IMU/EMG user interface for assistive robots", VI Congresso Nazionale di Bioingegneria, Milan, June 25-27, 2018.

[NC4] C. Lauretti, F. Cordella, L. Zollo, “A Hybrid Joint/Cartesian DMP-based motion planner for anthropomorphic robots", VI Congresso Nazionale di Bioingegneria, Milan, June 25-27, 2018.

[NC3] F. Cordella, “Tecnologie per Assistenza". Quaderni Scienza & Vita, 2017.

[NC2] F. Cordella, R.A. Romeo, A.G. Cutti, R. Sacchetti, A. Davalli, E. Guglielmelli, L. Zollo, "Experimental framework for human hand biomechanical analysis", V Congresso Nazionale di Bioingegneria, Naples, 2016.

[NC1] F. Cordella, L. Zollo, E. Guglielmelli, “Hand motion reconstruction with optoelectronic systems and model-based stochastic methods”, IV Congresso Gruppo Nazionale Bioingegneria, 2014.

National Book Chapters

[NB1] F. Cordella, A.L. Ciancio, L. Zollo, “Robot-assisted post-surgery rehabilitation", GNB, 2019.

National Journal Papers

[NJ1] F. Cordella, E. Guglielmelli, L. Zollo, “Bisogni, limiti attuali dello stato dell’arte e sfide di ricerca per lo sviluppo di dispositivi protesici di mano ad alto impatto per il reinserimento sociale dell’amputato di arto superiore", Rivista degli infortuni e delle malattie professionali - INAIL, 2019.

Patent

[P3] A. Scarpelli, F. Cordella, L. Zollo, Sistema di Stimolazione Multimodale ((Italian and PCT Patent Application), N. 102023000023424, Date of submission: 7 November 2023

[P2] N.L. Tagliamonte, A. Ceccarelli, F. Taffoni, F. Cordella, L.Zollo, M. Lapresa, L. Nini, E. Gruppioni, K. Morellato, Metodo di progettazione e realizzazione di una protesi di mano personalizzata (Italian and PCT Patent Application) - N. 102023000008163, Date of submission: 26 April 2023.

[P1] C. Lauretti, F. Cordella, L.Zollo, P. Larizza, Apparato e metodo di controllo di un manipolatore robotico (Italian and PCT Patent Application) - N. 102020000001900, Date of submission: 31 January 2020

Trattamento Dati Personali

La sottoscritta Francesca Cordella è a conoscenza che, ai sensi dell’art.26 della legge 15/68, le dichiarazioni mendaci, le falsità negli atti e l’uso di atti falsi sono puniti ai sensi del codice penale e delle leggi speciali. Inoltre, la sottoscitta, ai sensi della legge 675/96 (tutela delle persone e di altri soggetti rispetto al trattamento dei dati personali) e dell’art. 13 del D.Lgs 30 giugno 2003 n. 196, AUTORIZZA al trattamento dei dati personali contenuti nel presente curriculum.

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