

Curriculum Vitae with List of Publications

Domenico Prattichizzo

University of Siena

October 2015

HIGHLIGHTS

ACADEMIC POSITION

From October 2015 Domenico Prattichizzo, henceforth the scientist, is Full Professor at the University of Siena.

From 2002 to October 2015 the scientist, has been Associate Professor at the University of Siena.

COORDINATION OF A FOUR YEARS EUROPEAN IP FP7 COLLABORATIVE PROJECT

The scientist is **Coordinator of the European IP Collaborative Project** FP7-ICT-2011-9-601165 (Grant Agreement: 601165 and Call Number: FP7-ICT-2011-9) “WEARHAP: WEARable HAPtics for Humans and Robots”, 01/03/2013-28/02/2017. The project has been supported by the European Commission with 7,7 millions of Euro and involves 10 European research centers. More than 1,3 millions of Euro have been assigned to the University of Siena. 2013-2017.

FUNDED RESEARCH PROJECTS

The scientist is particularly active in the research activity. Since 2006, he coordinated several research projects funded by research agencies, public and private bodies for more than 5 millions of Euros, of which almost 3 millions funded by the European Union. Thanks to the research funding, the scientist funded 6 PhD positions within the PhD Program of Information Engineering and Science at the University of Siena.

COORDINATION OF RESEARCH GROUP AND LAB

Currently, the scientist is leading a research group at the University of Siena with 8 PhD students, 5 post-docs and 1 administrative. Since the Academic Year 2001/2002 the scientist has been academic supervisor of more than 22 PhD students. He has actively participated to the grow of the Research Lab.

PUBLICATIONS

Guest Co-Editor of Special Issue “Robotics and Neuroscience” of the Brain Research Bulletin, 2008.

Co-author of the chapter “Grasping” of the Springer “Handbook of Robotics”, 2008, awarded with two PROSE Awards presented by the American Association of Publishers.

Author of the chapter “Robot Grasp Control” of the Springer “Encyclopedia of Systems and Control”, 2014.

Co-editor of two books by STAR, Springer Tracks in Advanced Robotics, Springer (2003, 2005).

His research interests are in haptics, robotic grasping, visual servoing, mobile robotics, medical robotics and geometric control. The scientist published more than 260 papers in the aforementioned research areas.

EDITORIAL ACTIVITY

From 2007 to 2013 Co-Editor in Chief of the IEEE Transactions on Haptics. He participated to the foundation of the IEEE Transactions on Haptics in 2007.

Since 2015, Associate Editor of the IEEE Robotics and Automation Letters.

Since 2014, Associate Editor of Frontiers of Biomedical Robotics.

From 2003 to 2007, Associate Editor of the IEEE Transactions on Robotics.

From 2003 to 2007, Associate Editor of the IEEE Transactions on Control Systems Technologies.

ROLE IN SCIENTIFIC SOCIETIES

From 2013 Chair of the IEEE RAS Early Career Awards Evaluation Panel.

From 2006 to 2010, Vice-chair for Special Issues of the IEEE Technical Committee on Haptics.

From 2006 to 2010, Chair of the Italian Chapter of the IEEE RAS, awarded with the IEEE 2009 Chapter of the Year Award.

AWARDS AND TALKS

In 2014 the scientist got the Intuitive Surgical Technology Research Grant with the research project “Comparison of Cutaneous Feedback Methods for Pinching Palpation in Robotic Surgery”, founded by the Intuitive Surgical, Inc. which is the global technology leader in minimally invasive robotic-assisted surgery.

In 2014 he got the MathWorks Education Award for developing the Massive Open Online Course (MOOC) on “Art of Grasping and Manipulation in Robotics.”

Coordinator of the project “RemoTouch” selected as one of the projects to represent Italian Innovation at Shanghai 2010 Expo within the program “Italia degli innovatori” promoted by Ministro per la Pubblica Amministrazione e l’Innovazione and by the Commissario Generale del Governo per l’Expo 2010,

Winner of the “IEEE Robotics and Automation Society (RAS) 2007 Funds New Initiatives Competition” by IEEE Robotics and Automation Society with the project “Robotics in Second Life”, 2007.

Invited Keynote Speaker at the “7th International Workshop on Human Friendly Robotics - HFR2014”, October 2014.

Gave a TEDX talk in Rome in February 2014 <http://tinyurl.com/prattichizzo-tedx> and a RNext talk in Siena in June 2014 <http://tinyurl.com/prattichizzo-rnext>

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1 Current Position in Academia and Research Institutions

Qualification/Title	Full Professor, from October 1, 2015
University	Università degli Studi di Siena
Department	Dipartimento di Ingegneria dell'Informazione e Scienze Matematiche

Qualification/Title	Consultant as Senior Scientist, 2009–present
Research Center	Istituto Italiano di Tecnologia
Department	Department of Advanced Robotics

2 Previous Positions in Academia

Qualification/Title	Associate Professor, 2002–2015 (September)
University	Università degli Studi di Siena
Department	Dipartimento di Ingegneria dell'Informazione

Qualification/Title	Assistant Professor, 1998–2002
University	Università degli Studi di Siena
Department	Dipartimento di Ingegneria dell'Informazione

3 Education and training

Date	1995
Research Institution	Massachusetts Institute of Technology (MIT), MA USA
Position	Post Doc as Visiting Scientist at the Artificial Intelligence Laboratory

Date	1995
Institution which issued the degree	Università di Pisa
Type of Degree awarded	PhD in Robotics and Automation with the Thesis on “Structural properties and control of grasping in robotic manipulation”

Date	09/04/1991
Institution which issued the degree	Università di Pisa
Type of Degree awarded	Master of Science's Degree in Electronics Engineering

4 Scientific activity

4.1 The three most important results

The three most important results of the research activity of the scientist are:

[PT-SH08] D. Prattichizzo, J. Trinkle. Grasping. In Springer Handbook on Robotics, [This Handbook was honored by Association of American Publisher with the prestigious PROSE Award for Excellence in Physical Sciences and Mathematics. The Handbook was also the winner in the subcategory Engineering and Technology.], B. Siciliano, O. Kathib (eds.), pp. 671-700, Springer, 2008.

[DCPM-TOH13] D. Prattichizzo, F. Chinello, C. Pacchierotti, M. Malvezzi. Towards wearability in fingertip haptics: a 3-DoF wearable device for cutaneous force feedback. IEEE Transactions on Haptics, 6(4):506-516, 2013. This paper has received great attention from the community, and it is, at the day of writing, the most popular Trans. on Haptics paper in IEEEExplore, with more than 888 downloads since its publication.

[MOP-TRO07] G.L. Mariottini, G. Oriolo, D. Prattichizzo. Image-based visual servoing for nonholonomic mobile robots using epipolar geometry. IEEE Trans. on Robotics, 23(1):87-100, 2007. This paper is relevant since it is very well cited (139 citation in Google Scholar) and represents the starting point of very successful research activities in the field of mobile robots.

4.1.1 Modeling the multifingered grasp

In the timeline of the scientist's research career, the analysis and control of the robotic grasping by multi-fingered hands represents the first important contribution and the chapter on "Grasping" of the *Springer Handbook of Robotics* summarizes all the main research findings by the scientist and his co-author Jeff Trinkle. The chapter is not a survey but has been written to serve as a handbook for interested researchers. This work introduces fundamental models of grasp analysis. An elegant system theoretic framework is proposed to analyze five primary grasp types whose physical interpretations provide insight for grasp and manipulation planning. After introducing the basic model and types of grasps, this chapter focuses on the most important grasp characteristics: two primary restraint properties such as form closure and force closure.

This Handbook was honored by Association of American Publisher with the prestigious PROSE Award for Excellence in Physical Sciences and Mathematics. The Handbook was also the winner in the subcategory Engineering and Technology. Moreover, this Handbook was honored by Association of American Publisher with the prestigious PROSE Award for Excellence in Physical Sciences and Mathematics. The Handbook was also the winner in the subcategory Engineering and Technology.

Being part of a so prestigious opera qualifies the scientist as a distinguished international expert in the field of robotic grasping.

Hands and the control of grasp are very important in robotics, since they represent the ultimate interface of robots with the environment. This book chapter is thus very important since it lays the foundations of a challenging research problem investigated by the scientist. The large variety of kinematic structures of robotic hands and their increasing complexity, requires a strong simplification of their programming and control. It is essential for the exploitation of robotics in everyday life to develop a common framework to program and control robotic hands independently from their kinematics, mechanical construction, and sensor equipment complexity. This research was inspired by the organization of the human hand: the human hand is a complex structure, with

many degrees of freedom with respect to the dimension of the controlled workspace. However, the hand sensorimotor transformations impose constraints between the degrees of freedom, so that the number of effective degrees of freedom is much lower than the number of joints. The reduced set of parameters that we effectively use to control our hands is known in the literature as the set of *synergies*. Starting from the research results on robotic grasping summarized in the Handbook Chapter, the scientist provided contributions on how the synergistic organization of the human hand represents an innovative approach to the design of a unified framework for controlling grasp and manipulation of robotic hands. These are the most representative papers published by the scientist in the field in the last few years:

D. Prattichizzo, M. Malvezzi, M. Gabbicini, A. Bicchi. On Motion and Force Controllability of Precision Grasps with Hands Actuated by Soft Synergies. *IEEE Transactions on Robotics*, 29(6):1440-1456, 2013.

S. Mulatto, A. Formaglio, M. Malvezzi, D. Prattichizzo. Using Postural Synergies to Animate a Low-dimensional Hand Avatar in Haptic Simulation. *IEEE Trans. on Haptics*, 6(1):106-116, 2013.

G. Gioioso, G. Salvietti, M. Malvezzi, D. Prattichizzo. Mapping Synergies from Human to Robotic Hands with Dissimilar Kinematics: an Approach in the Object Domain. *IEEE Trans. on Robotics*, 29(4):825-837, 2013.

M. Gabbicini, A. Bicchi, D. Prattichizzo, M. Malvezzi. On the role of hand synergies in the optimal choice of grasping forces. *Autonomous Robots*, Springer, 31:235-252, 2011.

The scientist's research on grasping has obtained outstanding recognitions by the international scientific community, and this is confirmed by the impact of his research on robotic grasping and manipulation and by the two cooperative projects funded by the European Commission:

1. Coordinator of the ECHORD experiment HANDS.DVI within the European IP collaborative project FP7-ICT-2007-2-231143 "European Clearing House for Open Robotics Development" (ECHORD), Experiment "A DeVice-Independent programming and control framework for robotic HANDS" (HANDS.DVI), 01/10/2010-30/06/2012. This project was funded for 300 thousands Euro (for three partners) by the European Commission. 2010-2012.
2. European IP collaborative project FP7-ICT-2009-4- 248587 "The Hand Embodied" (THE), 01/03/2010-31/05/2014 - Role: Coordinator of the UNISI research unit in Siena. Funding to the University of Siena for almost 700 thousands Euro. 2010-2014.

and by the fact that in February 2014, the scientist won

the MathWorks Education Award for developing the Massive Open Online Course (MOOC) on "Art of Grasping and Manipulation in Robotics." The MOOC will be delivered in 2016.

The chapter on Grasping of the Springer Handbook is a pillar of the MOOC on "Art of Grasping and Manipulation in Robotics."

4.1.2 Wearable haptics

A recent paper, which very well represents the work the scientist has done and is doing in the field of haptics, is "Towards wearability in fingertip haptics: a 3-DoF wearable device for cutaneous

force feedback” by D. Prattichizzo, F. Chinello, C. Pacchierotti, M. Malvezzi, published in 2013 in the IEEE Transactions on Haptics, the reference journal for the field of haptics, with an impact factor of 2.03.

This paper represents a milestone in the field of haptics where the robotic devices, to provide force feedback, were either grounded or cumbersome exoskeletons. In fact paper [DCPM-TOH13] introduces in the field novel design guidelines for wearable haptics and presents a novel 3-DoF wearable device able to apply contact deformation feedback directly to the fingertip. The device consists of two platforms: a static one, placed on the back of the finger, and a mobile one, responsible for applying forces at the finger pad. The structure of the device resembles that of parallel robots, where the fingertip is placed in between the static and the moving platforms. This paper presents the design of the wearable display, along with the quasi-static modeling of the relationship between the applied forces and the platform’s orientation and displacement and the contro. To validate the device and verify its effectiveness, a curvature discrimination experiment was successfully carried out.

The paper has received great attention from the haptics and robotics community, and it is, at the day of writing, the most popular Transactions on Haptics paper in the IEEEExplore website, which is the official website of the editor. The paper is in this position since three months, with 888 downloads since its publication. The impact of this paper’s results on the scientist’s research activity is relevant since it also served as background for three journal papers all published in 2014:

L. Meli, C. Pacchierotti, D. Prattichizzo. Sensory subtraction in robot-assisted surgery: fingertip skin deformation feedback to ensure safety and improve transparency in bi-manual haptic interaction. IEEE Transactions on Biomedical Engineering, 61(4):1318-1327, 2014.

C. Pacchierotti, A. Tirmizi, D. Prattichizzo. Improving Transparency in Teleoperation by Means of Cutaneous Tactile Force Feedback. ACM Transactions on Applied Perception, 11(1):4-4, 2014.

G. Rosati, F. Oscari, C. Pacchierotti, D. Prattichizzo. Effects of kinesthetic and cutaneous stimulation during the learning of a viscous force field. IEEE Transactions on Haptics, Special Issue on Haptics in Rehabilitation and Neural Engineering, 7(2):251-263, 2014.

However, the most notable outcome of the ideas and concept presented in the paper is the *FP7 IP Collaborative Project WEARHAP: Wearable Haptics for Humans and Robots*. The project has been funded by the European Commission with 7.3M in total, of which 1.3M given to the scientist’s group. The scientist is the Coordinator of the project. The major contribution of the WEARHAP project consists of laying the scientific and technological foundations for wearable haptics, a novel concept for the systematic exploration of haptics in advanced cognitive systems and robotics that enables novel forms of communication and cooperation between humans and robots. Within the project several complementary approaches, able to interact with different parts of the human body through the sense of touch, are investigates.

All the work that led to the WEARHAP project started with the ideas presented in the Transactions of Haptics paper, especially in those sections discussing the importance of wearability in robotics and its role in human-robot interaction. The need for wearability in haptics and robotics in general is, in fact, a key element for natural interaction. This paradigm shift will enable novel forms of human intention recognition through haptic signals and novel forms of communication and cooperation between humans and robots. Wearable haptics will enable robots to observe humans during natural interaction with their shared environment. Research challenges are ambitious and cross traditional boundaries between robotics, cognitive science and neuroscience.

Research findings derived from distributed robotics, biomechanical modeling, multisensory tracking, underactuation in control and cognitive systems can be integrated to address the scientific and technological challenges imposed in creating effective wearable haptic interaction. To highlight the enabling nature, the versatility and the potential for industrial exploitation of WEARHAP, the research challenges will be guided by representative application scenarios. These applications cover robotics, health and social scenarios, stretching from human-robot interaction and cooperation for search and rescue, to human-human communication, and interaction with virtual worlds through interactive games.

This impact of the scientist's research on haptics is also confirmed and by the fact that in October 2014, the scientist got

Intuitive Surgical Technology Research Grant (50 KUSD) with the research project "Comparison of Cutaneous Feedback Methods for Pinching Palpation in Robotic Surgery" in 2015. Founded by the Intuitive Surgical, Inc. which is the global technology leader in minimally invasive robotic-assisted surgery. In cooperation with University of Pennsylvania.

4.1.3 Computer vision and mobile robots

The paper "Image-based visual servoing for nonholonomic mobile robots using epipolar geometry." by G.L. Mariottini, G. Oriolo, D. Prattichizzo published in IEEE Trans. on Robotics in 2007 is one of the first paper in the literature formalizing the problem of visual servoing for nonholonomic mobile robots. Nonholonomic kinematic constraints added a level of complexity in visual servoing never seen for articulated manipulators that were well known in the literature at that time.

The paper stated the problem of visual servoing for nonholonomic mobile robots and proposed an image-based visual servoing strategy for driving the mobile robot equipped with a pinhole camera toward a desired configuration. The strategy exploits the epipolar geometry defined by the current and desired camera views, does not need any knowledge of the 3-D scene geometry. Moreover to the best of our knowledge the scientist was the first to use the epipolar geometry in visual servoing.

The impact of this paper is relevant since it is very well cited (139 citation in Google Scholar) in the literature and represents a milestone in the research activity of the scientist since it introduces a new interesting subject of research: *computer vision and leader-follower formation control of mobile robots* whose main contributions are here listed:

L. Consolini, F. Morbidi, D. Prattichizzo, M. Tosques. On a class of hierarchical formations of unicycles and their internal dynamics. Automatic Control, IEEE Transactions on, pages 845-859, April 2012.

G.L. Mariottini, S. Scheggi, F. Morbidi, D. Prattichizzo. An Accurate and Robust Visual-Compass Algorithm for Robot-mounted Omnidirectional Cameras. Robotics and Autonomous Systems, Elsevier, 60(9):1179-1190, 2012.

G.L. Mariottini, S. Scheggi, F. Morbidi, D. Prattichizzo. Planar Mirrors for Image-based Robot Localization and 3-D Reconstruction. Mechatronics, Special Issue on Visual Servoing, Elsevier, 22:398-409, 2012.

F. Morbidi, F. Bullo, D. Prattichizzo. Visibility Maintenance via Controlled Invariance for Leader-Follower Vehicle Formations. Automatica, 47(5):1060-1067, 2011.

F. Morbidi, G.L. Mariottini, D. Prattichizzo. Observer Design Via Immersion and Invariance for Vision-based Leader-follower Formation Control. Automatica, 46(1):148-154, January 2010.

G.L. Mariottini, F. Morbidi, D. Prattichizzo, N. Vander Valk, N. Michael, G.J. Pappas, K. Daniilidis. Vision-based Localization for Leader-Follower Formation Control. *IEEE Trans. on Robotics*, 25(6):1431-1438, December 2009.

L. Consolini, F. Morbidi, D. Prattichizzo, M. Tosques. Stabilization of a hierarchical formation of unicycle robots with velocity and curvature constraints. *IEEE Trans. on Robotics*, 25(5):1176-1184, October 2009.

L. Consolini, F. Morbidi, D. Prattichizzo, M. Tosques. Leader-Follower Formation Control of Nonholonomic Mobile Robots with Input Constraints. *Automatica*, 44(5):1343-1349, May 2008.

G.L. Mariottini, D. Prattichizzo. Image-based Visual Servoing with Central Catadioptric Camera. *International Journal of Robotics Research*, 27:41-57, 2008.

G. Chesi, D. Prattichizzo, A. Vicino. Straight line path-planning in visual servoing. *Journal of Dynamic Systems, Measurement and Control*, 129(4):541-543, 2007.

More recently the scientist contributed to the research for assistive technologies for visually impaired people using the methods developed within this research activity as shown in the paper

S. Scheggi, F. Morbidi, D. Prattichizzo. Human-robot formation control via visual and vibrotactile haptic feedback. *IEEE Trans. on Haptics*, 2014.

and the submitted patent *Tactile Angel: a Remote Guidance of Blind and Visually Impaired People with Wearable Tactile Feedback*, presented by the scientist at the TEDxRome, has been protected with a patent that is currently pending. The registration of the patent dates February 2014.

<http://tinyurl.com/prattichizzo-tedx>

5 Coordination of research and technology transfer groups and project

5.1 Coordination of the research group and lab activity

Currently, the scientist is leading a research group with 8 PhD students, 5 post-docs and 1 administrative. Since the Academic Year 2001/2002 the scientist has been academic supervisor of 22 PhD students.

The main activity of the research team is developed in the Robotics and Systems Lab of the University of Siena. The scientist pays a particular attention to the scientific grow of the team and tends to share with the group the main strategies regarding the research activity. A special attention is devoted to the advanced teaching activities during the PhD.

The research team is doing active research towards the new paradigms of human-robot integrations through the design of new embodied sensorimotor interfaces.

Since 2008, the research group was able to attract funding for more than 4 millions euros thanks to large projects supported by the European Commission, the Italian Government and by private foundations and private companies.

Thanks to this funding, the group contributed to the grow of the facilities of the laboratory of his research group purchasing the following main equipments which are part of his lab:

Robotic hands/arms and mobile robots:

1. KUKA KR3 robot arm
2. Kinova Inc. MICO Arm
3. DLR Hand II (Multisensory Five-Finger Dexterous Hand)
4. SimLab Co. Ltd Allegro Hand
5. Pioneer LX Research Platform
6. Flight Ctrl V2.5 me (Quadrotor)

Haptic Interfaces:

1. n. 2 Force Dimension Omega.3 devices
2. Force Dimension Omega.6 device
3. Force Dimension Omega.7 device
4. n. 2 HAPTX Falcon Dreampack devices
5. Sensable Inc. Phantom Desktop
6. Sensable Inc. Phantom Premium

3D Printer:

1. 3D Printer Dimension ELITE

Tracking Systems:

1. VICON Motion Capture 3. n.5 Kinect devices
2. ASCENSION 3D Guidance Trakstar 6Dof Tracking System
3. n. 6 RGBD (Kinect) camera devices

Other Equipments:

1. Instrumented Mercury Walker to assist older adults.

Another important peculiarity of the research team is that of fostering cooperation with other research groups. A selection of those international partnerships follows:

- The European Project WEARHAP led to direct collaborations with the University of Umea, University Pierre et Marie Curie, University Rey Juan Carlos, and the Technical University of Munich.
- The European Project DALi led to direct collaborations with the Northumbria University and the Foundation for Research and Technology - Hellas.
- Student exchange programmes led to direct collaborations with the University of Pennsylvania, Intuitive Surgical (California), the University of Twente, the German Aerospace Center and the CERN.

5.1.1 *Supervisor of 25 PhD students since 2001*

PhD Candidates

1. Maria Pozzi, PhD student in Information Engineering and Mathematics at Università di Siena (XXXI Ciclo - 2015/2016). [Fellowship funded by the Istituto Italiano di Tecnologia di Genova]
2. Daniele Benedettelli, PhD student in Information Engineering and Mathematics at Università di Siena (XXXI Ciclo - 2015/2016).
3. Olmo Alonso Moreno Franco, PhD student in in Humanoid and Life Technologies at University of Genova and Istituto Italiano di Tecnologia (XXXI Ciclo - 2015/2016)
4. Tommaso Lisini, PhD student in Information Engineering and Mathematics at Università di Siena (XXX Ciclo - 2014/2015).
5. Irfan Hussain, PhD student in Information Engineering and Mathematics at Università di Siena (XXIX Ciclo - 2013/2014).
6. Mostafa Mohammadi, PhD student in Information Engineering and Mathematics at Università di Siena (XXIX Ciclo - 2013/2014). [Fellowship funded by the Istituto Italiano di Tecnologia di Genova]
7. Agostino Talarico, PhD student in Information Engineering and Mathematics at Università di Siena (XXIX Ciclo - 2013/2014).
8. Asad Tirmizi, PhD student in Information Engineering and Mathematics at Università di Siena (XXVIII Ciclo - 2012/2013).
9. Marco Aggravi, PhD student in Information Engineering and Mathematics at Università di Siena (XXVIII Ciclo - 2012/2013).
10. Leonardo Meli, PhD student in Information Engineering and Mathematics at Università di Siena (XXVIII Ciclo - 2012/2013). [Fellowship funded by the Istituto Italiano di Tecnologia di Genova]
11. Guido Gioioso, PhD student in Information Engineering at Università di Siena (XXVII Ciclo - 2011/2012). [Fellowship funded by the Istituto Italiano di Tecnologia di Genova]

PhD Degree

12. Claudio Pacchierotti, PhD student in Information Engineering at Università di Siena (XXVII Ciclo - 2011/2012). [Fellowship funded by the Istituto Italiano di Tecnologia di Genova].
13. Adrian Ramos, PhD student in Information Engineering at Università di Siena (XXVI Ciclo - 2010/2011). [Fellowship funded by the Istituto Italiano di Tecnologia di Genova]. Currently Post-Doc at the Istituto Italiano di Tecnologia.
14. Francesco Chinello, PhD in Information Engineering at Università di Siena (XXVI Ciclo - 2010/2011). Currently Post-Doc at the University of Siena.
15. Gionata Salvietti, PhD in Information Engineering at Università di Siena (XXV Ciclo - 2009/2010). Currently Post-Doc at the Istituto Italiano di Tecnologia in Genova.
16. Stefano Scheggi - 2008/2009), PhD in Information Engineering at Università di Siena (XXIV Ciclo). Post-Doc at the University of Siena (2015).
17. Rudy Manganeli, PhD in Information Engineering at Università di Siena (XXIII Ciclo - 2007/2008). Currently private research consultant.
18. Sara Mulatto, PhD in Information Engineering at Università di Siena (XXII Ciclo - 2007/2008). Currently in a private company working on modeling and computer graphics.
19. Marcello Orlandesi, PhD in Information Engineering at Università di Siena (XXI Ciclo - 2006/2007). Currently in a company working on the technology transfer.
20. Fabio Morbidi, PhD in Information Engineering at Università di Siena (XXI Ciclo - 2006/2007). Currently **Assistant professor** at Università de Picardie Jules Verne, Amiens France.
21. Alessandro Formaglio, PhD in Information Engineering at Università di Siena (XX Ciclo - 2005/2006). Currently at Novartis Vaccines.
22. Maurizio de Pascale, PhD in Information Engineering at Università di Siena (XX Ciclo - 2005/2006). **Technical Architect** at Ubisoft Montreal (2015)
23. Gian Luca Mariottini, PhD in Information Engineering at Università di Siena (XVIII Ciclo - 2003/2004). Currently **Assistant Professor** at the Computer Science and Engineering Dept. of the University of Texas at Arlington.
24. Jacopo Piazzzi, PhD in Information Engineering at Università di Siena. (XVI Ciclo - 2001/2002). Currently **Executive Manager** at the Swiss-Italian integrated biotechnology company Philogen.
25. Marco Fei, PhD in Ingegneria dell'Informazione at Università di Siena (XXII Ciclo - 2007/2008). He didn't get the Degree since he left during the second year. Currently in a company working in gaming.

5.2 National and international research projects with peer-review process

5.2.1 Project coordinator of a FP7 IP collaborative european project

1. Coordinator of the European IP collaborative project FP7-ICT-2011-9-601165 (Grant Agreement: 601165 and Call Number: FP7-ICT-2011-9) "WEARHAP: WEARable HAPtics for

Humans and Robots”, 01/03/2013-28/02/2017. The project has been supported by the European Commission with 7.7 millions of Euro and involves 10 European research centers (more than 1.3 millions of Euro are for the Coordinator research unit). 2013–2017.

5.2.2 Project coordinator of an experiment of FP7 ECHORD european project

1. Coordinator of the ECHORD experiment HANDS.DVI within the European IP collaborative project FP7-ICT-2007-2-231143 “European Clearing House for Open Robotics Development” (ECHORD), Experiment “A DeVice-Independent programming and control framework for robotic HANDS” (HANDS.DVI), 01/10/2010-30/06/2012. This project was funded for 300 thousands Euro by the European Commission (EC). 2010–2012.

5.2.3 Principal investigator in European Projects

1. European Large Project “ACANTO: A CyberphysicAl social NeTwOrk using robot friends” supported by the EC within the HORIZON 2020 call “Health, demographic change and wellbeing Personalising health and care: Advancing active and healthy ageing H2020-PHC-19-2014 Research and Innovation Action”. Role: Coordinator of the research unit. Funding to the research unit for almost 360 thousands euros by the EC. 2015–2019.
2. European STREP collaborative project FP7-ICT-2011-7-288917 “Devices for Assisted Living” (DALi), 01/11/2011-31/10/2014 - Role: Coordinator of the research unit. Funding to the research unit for almost 400 thousands euros by the EC. 2011–2014.
3. European IP collaborative project FP7-ICT-2009-4- 248587 “The Hand Embodied” (THE), 01/03/2010-31/05/2014 - Role: Coordinator of the research unit. Funding to the research unit for almost 700 thousands euros by the EC. 2010–2014.
4. European STREP collaborative project FP7-ICT-2007-215190 “ROBot and SENSors INtegration as Guidance FOR Enhanced Computer Assisted Surgery and Therapy” (ROBOCAST), 01/01/2008-31/12/2010. - Role: Coordinator of the research unit. Funding to the research unit for almost 300 thousands euros by the EC. 2008–2010.

5.2.4 Project coordinator of IEEE RAS special initiative competition

1. Coordinator of the project “Robotics in Second Life” funded by the IEEE Robotics and Automation Society as winner of the award “IEEE Robotics and Automation Society (RAS) 2007 Funds for Special Initiatives Competition”, 2007 [See also the section on awards].

5.2.5 Principal Investigator in national projects (PRIN)

1. PRIN 2008 project “Underactuated systems for manipulation in virtual environment” funded by Italian Ministry of Education, University and Research, 22/03/2010-22/09/2012 - Role: Coordinator of the UNISI research unit in Siena.
2. PRIN 2005 project “AIDA: Applicazioni e Design di interfacce Aptiche: contatto soffice, multi-punto e integrazione multi-modale”, funded by Italian Ministry of Education, University and Research, 30/01/2006- 29/01/2008 - Role: Coordinator of the UNISI research unit in Siena.

5.2.6 Principal Investigator in projects funded by Tuscany region

1. Project funded by the Tuscany Region to facilitate the participation to activities of research, technological development and demonstration within the EU 7th Framework Programme 2007-2013.

5.2.7 Principal Investigator in projects funded by University of Siena

1. Coordinator and Principal Investigator of the project “SI3 - Sistema Integrato per lo studio dell’Interazione uomo-macchina e la realizzazione di Interfacce multimodali.” in Progetto Grandi Attrezzatura funded by Università di Siena. 2004.
2. Coordinator and Principal Investigator of the project “Robotic systems for studying human grasping. Possibile clinical and rehabilitative implications.” 2004–2006. Funded within the Piano di Ateneo per la Ricerca of the University of Siena.
3. Coordinator and Principal Investigator of the project “Sviluppo di sistemi basati su interfacce aptiche per applicazioni mediche” 2002–2004. Funded within the Piano di Ateneo per la Ricerca of the University of Siena.
4. Coordinator and Principal Investigator of the project “Controllo basato sulla visione per applicazioni robotiche avanzate” 1999–2000. Funded within the program Progetto Giovani Ricercatori of the University of Siena

5.3 National and international research projects with companies and public/private bodies

5.3.1 International partnership

1. Intuitive Surgical Technology Research Grant (50 KUSD) with the research project “Comparison of Cutaneous Feedback Methods for Pinching Palpation in Robotic Surgery” in 2015. Founded by the Intuitive Surgical, Inc. which is the global technology leader in minimally invasive robotic-assisted surgery. In cooperation with University of Pennsylvania.

http://intuitivesurgical.com/company/educational-grants/technology_grants.html

2. MathWorks Education Award (40 KEuro) for developing the Massive Open Online Course (MOOC) “Art of Grasping and Manipulation in Robotics” during the Academic year 2014-2015. [See also the section on awards]
3. Principal investigator of a research agreement on “3D reconstruction from cameras” between QUALUP SAS Montbellet (France) and the University of Siena. 2005.

5.3.2 Private foundations

1. The collaboration with the Fondazione Istituto Italiano di Tecnologia is running since 2009 and it has been very fruitful for the research activity of the scientist. In particular the Fondazione supported the research group led by the scientist funding 7 PhD student fellowships at the University of Siena.
2. Fondazione Monte dei Paschi di Siena funded the Project n. 27320 on “Studio della Mano Umana con Metodologie e Tecnologie Robotiche per Applicazioni in Neuroscienze e Riabilitazione” in 2007-2008.

5.3.3 Private companies

1. Principal investigator of a large project (400 KEuro), ruled through an agreement in 2013 between the University of Siena and companies ATOP S.p.A. e Elcon S.a.S., to study “Miniaturizzazione del Motore Elettrico” within a project supported by Regione Toscana with POR Creo Fesr 2007-2013.
2. Principal investigator of a large project (210 KEuro), ruled through an agreement in 2013 between the University of Siena and companies ATOP S.p.A., SFERA S.r.l. e C.R.T. S.n.c., to study “Processi Produttivi Efficienti Per Motori Elettrici Automotive” within project PROEMA, funded by Regione Toscana in 2013 with Bando UNICO R&S 2012: Linea A.
3. Principal investigator of a research agreement on “Studio, progettazione e sviluppo di una soluzione software basata su un algoritmo di elaborazione delle immagini per l’individuazione del moto di persone” between the Dipartimento di Ingegneria dell’Informazione, Università di Siena, and the company Società CESVIT Microelettronica S.r.l., Prato Italia, 2007.
4. Contract with company 3E Ingegneria, funded by ENEA, on “Realizzazione di un osservatore dinamico dello stato di carica delle batterie di alimentazione di un veicolo elettrico”, 1999.
5. Contract with company SELFIN Spa in Caserta for research on “Computer Vision e Robotics,” 2005.
6. Contract with company Alfa Elettronica in Colle Val d’Elsa for research on “PLC: controllori a logica programmabile,” 1999.

5.4 Outcomes obtained in the field of technology transfer

5.4.1 Patents pending

The idea of Tactile Angel: a remote guidance of blind and visually impaired people with wearable tactile feedback, presented by the scientist at the TEDxRome, has been protected with a patent that is currently pending. The registration of the patent dates February 2014.

<http://tinyurl.com/prattichizzo-tedx>

5.4.2 Copyrights

The scientist contributed to design and implementing the Automatic Control Telelab (ACT) in my Department (<http://act.dii.unisi.it/home.php>). The ACT is a remote laboratory developed with educational purposes that allows students to perform remote control experiments on physical processes. The related software is covered by the following copyright.

Co-author with A. Vicino, M. Casini e A. Garulli of a software for a telelab of automation (www.dii.unisi.it/control/act/index.html). Il software is protected by Diritti d’Autore (Copyright) *Registro Pubblico per i programmi per elaboratore - Data di registrazione 21/12/01 - Numero progressivo 002113 - Ordinativo D002741. Registro Pubblico per i programmi per elaboratore - Date 21/12/01 - Number 002113 - D002741.*

6 National and international reputation and professional activity for the scientific community

6.1 Editorship of journals

Co-Editor in Chief of *IEEE Transactions on Haptics*. 2007–2013. *IEEE Transactions on Haptics* is a journal born in 2007 of the IEEE Robotics and Automation Society, IEEE Computer Society, and IEEE Consumer Electronics Society.

The scientist participated to the foundation of the IEEE Transactions on Haptics.

6.2 Participation in the editorial board of journals

1. Associate Editor of the , *IEEE Robotics and Automation Letters*. 2015-present.
2. Associate Editor of *Frontiers of Biomedical Robotics*. 2014–present.
3. Associate Editor of *IEEE Transactions on Robotics*. 2003–2007.
4. Associate Editor of *IEEE Transactions on Control System Technologies*. 2003–2007.
5. Associate Editor of *Paladyn. Journal of Behavioral Robotics*. 2009–present.
6. Associate Editor of *Journal of Dynamics of Continuous, Discrete and Impulsive Systems (DCDIS) Series B: Application and Algorithms*. 2000 –2007.

6.3 Offices in the governing bodies of national and international scientific societies

6.3.1 Offices in IEEE Robotics and Automation Society

1. **Chair** of the “Italian Chapter of the IEEE Robotic and Automation Society (I-RAS)” , 2006-2010. Awarded with the ”2009 IEEE RAS Chapter of the Year Award.” [See also section on awards].
2. **Chair** of the “IEEE-RAS Early Career Award (Academic and Government/Industry) Evaluation Panel”, appointed by IEEE RAS President. Since 2013.
3. Member of the “IEEE AdHoc Committee for Plagiarism Case Evaluation,” appointed by IEEE Publishing Conduct Committee in 2012.
4. Vice-Chair for the Special Issue of the IEEE Technical Committee on Haptics winner of the award “Most Active Technical Committee of the Year IEEE Robotics and Automation Society for 2006,” received at ICRA 2007 in Rome. [See also section on awards].
5. Program Committee Chair of the 1st International Forum on Research and Technologies for Society and Industry organized by the IEEE Italy Section, Torino, Italy 16-18 Sep. 2015.

6.3.2 Reviewer of the european commission

1. Member of the Review Panel of European Commission to assessing the state and progress of action implementation of the FP7 STREP Collaborative Project ”CADDY: Cognitive Autonomous Diving Buddy”, Grant Agreement nÂ° 611373.

6.3.3 Board of evaluators for the european commission

1. Member of the Evaluation Panel of European Commission to evaluate project proposals (IP and STREP) of the Communication Technologies Call FP7-ICT-2013-10, 2013.
2. Member of the Evaluation Panel of ERA-NET of the CHIST-ERA, the European Coordinated Research on Long-term Challenges in Information and Communication Sciences & Technologies ERA-Net, 2013. This is a consortium of European funding organizations.
3. Reviewer for the European Research Council (ERC) grants, 2012 and 2014.

6.3.4 Board of evaluators for european countries

1. Member of the Evaluation Panel of Helmholtz Association of German Research Centres to evaluate project proposals of the Helmholtz Young Investigators Group, 2013.
2. Member of the Evaluation Panel for National Research Initiatives of the Research Council of Norway, 2012.
3. Member of the Evaluation Panel for National Research Initiatives of the Portuguese Foundation for Science and Technology, 2012.
4. Member of the Evaluation Panel for National Research Initiatives of the Czech Science Foundation (GACR), which is the main public body funding research of the Czech Republic, 2012.

6.3.5 Board of evaluators for public universities

1. Member of the Evaluation Panel of the Università degli Studi di Padova. (Sistema di finanziamento della ricerca nell'Ateneo).

6.4 Participation in societies

6.4.1 EuroHaptics society

Member of the Executive Board of the Euro Haptics Society, since July 2014.

6.4.2 IEEE society

Senior Member of the IEEE Robotics and Automation Society, since July 2014.

6.5 Prizes and awards

6.5.1 Selected awards

1. The journal paper “Towards Wearability in Fingertip Haptics: A 3-DoF Wearable Device for Cutaneous Force Feedbac” by D. Prattichizzo, F. Chinello, C. Pacchierotti, and M. Malvezzi is listed as December 19, 2015 in IEEEExplore as the **most popular** IEEE Transactions on Haptics paper. According to the IEEEExplore website most popular means the most frequently downloaded document according to the most recent monthly usage statistics.

2. Winner of the MathWorks Education Award for developing the Massive Open Online Course (MOOC) “Art of Grasping and Manipulation in Robotics,” February 2014.
3. Coordinator of the project “RemoTouch” selected as one of the project to represent Italian Innovation at Shanghai 2010 Expo within the program “Italia degli innovatori” promoted by Ministro per la Pubblica Amministrazione e l’Innovazione, Renato Brunetta, and by the Commissario Generale del Governo per l’Expo 2010, Beniamino Quinteri.
4. Chair of “Italian Chapter of the IEEE Society of Robotics and Automation” awarded with the “2009 IEEE RAS Chapter of the Year Award”.
5. Co-author of the Chapter on “Grasping” of the “Springer Handbook of Robotics” edited by Bruno Siciliano and Oussama Kathib. The Handbook was awarded within the “PROSE Awards 2008” with **two** awards: “PROSE Award for Excellence in Physical Sciences & Mathematics” and “PROSE Award in Engineering & Technology”.
6. Winner of the “IEEE Robotics and Automation Society (RAS) 2007 Funds New Initiatives Competition” by IEEE Robotics and Automation Society with the project “Robotics in Second Life”, 2007.
7. Vice-Chair for the Special Issue of the IEEE Technical Committee on Haptics winner of the award “Most Active Technical Committee of the Year IEEE Robotics and Automation Society for 2006” received at ICRA 2007 in Rome.
8. Co-author with A.A. Navarro Newball, F. Roviello, F.J. Herrera and C.A. Marin of the paper “Development of an interactive module to enhance and understand cavity navigation” awarded with Best in Show Price of the Telemed and eHealth in London Conference, 2006.
9. Co-author with A. Bicchi of the work “Manipulability of cooperating robots with passive joints” selected among the five finalists for the Best Conference Paper Award, of the IEEE International Conference of Robotics and Automation, Leuven, Belgium, 1998.

6.6 Distinguished invited speaker at international and national conferences

6.6.1 Invited Keynote Speaker

1. Invited Keynote Speaker with a talk on Wearable Haptics and Robotics at the “7th International Workshop on Human Friendly Robotics - HFR2014” organized by the BioRobotics Institute of Scuola Superiore Sant’Anna in collaboration with other European Universities and Research Institutions, Pontedera, Italy, October 2014.
2. Invited Keynote Speaker with a talk on Wearable Robotics at the “CVPR Workshop - HANDS 2015” organized by by Tae-Kyun Kim, A. Argyros and Greg Rogez, Boston, Massachusetts, June 12 2015.

6.6.2 International conferences and workshops

1. Invited lecture on “Human Robot Co-Grasping: a Rehab Case at the Finger Level” in the workshop on Towards a unifying framework for whole-body and manipulation control at Robotics Systems Science July 17, 2015.
2. Invited lecture on “Compensating Hand Function in Chronic Stroke Patients Through a Robotic Extra-Finger” in the workshop on Human Centered and Rehab Robotics, Istituto Italiano di Tecnologia, Genova March 24, 2015.

3. Invited lecture on “SynGrasp: a flexible Matlab toolbox for human and robotic hands” in the workshop on Common Platforms in Robotic Manipulation, organized by L. Odhner (Yale University), M. Ciocarlie (Willow Garage), A. Rodriguez (Carnegie Mellon University), A. Dollar (Yale University), M. Mason (Carnegie Mellon University) in the International Conference Robotics Science and Systems, RSS 2013, Berlin, Germany, June 2013.
4. Invited lecture on “Robotic and human grasps” in the workshop “Grasp Acquisition: How to Realize Good Grasps”, organized by J. Trinkle, P. Van der Smagt and T. Wimboeck in the International Conference Robotics, Systems and Science, RSS 2010, Zaragoza, Spain, 2010.
5. Invited lecture on “Visuo-haptic interaction in medical applications” at the Workshop on Advanced Computer Aided Surgery & Medical Image Processing in Tel Aviv within a project of cooperation between Israel and Italy, promoted by the Ministero degli Esteri, 2005.
6. Invited lecture on “Sensory Subtraction for Enhanced Haptic Feedback in Robotic Surgery” at the “Workshop Innovations in human-robot interaction for Surgical Robotics”, at the Hamlyn Symposium on Medical Robotics 2013, London, June 2013.
7. Invited lecture on “A synergy based approach to robotic hands and haptics” at the workshop *Robotics in Surgery: State of The Art*, organized by the Institution of Mechanical Engineers, London, November 2010.
8. Invited lecture on “A synergy based approach to robotic hands and haptics” at the Workshop *Human-friendly robotics*, Max Planck Institute, Tübingen, Germany, November 2010.
9. Invited lecture on “Towards new paradigms of human-robot integration” at the *2014 International Robotics Research Jam Session* Pisa, July 2014.
10. Invited lecture on “Connecting humans and robots through wearable haptics” at the *2013 International Robotics Research Jam Session* Pisa, July 2013.
11. Invited lecture on “Mapping human postural synergies to robots” at the *2011 International Robotics Research Jam Session* Pisa, July 2011.
12. Invited lecture on “Haptics Interfaces in medicine” at the Workshop on Biotechnologies and innovation for the future of surgery, in Università di Roma Tor Vergata - Policlinico Tor Vergata, Rome, May 2005.

6.6.3 National symposium

1. Invited lecture on “La Robotica Indossabile al Servizio della Qualità della Vita” at the Giornata di Dipartimento 2015, Department of Information Engineering and Mathematics, June 15, 2015.
2. Invited lecture on “Uomini che indossano robot” at the Giornata di Studio ROBOT: una MANO per l’UOMO, Pontificia Università San Tommaso d’Aquino, May 9, 2015.
3. Invited lecture on “Haptics and Wearable Devices” at the *XXII Congresso Nazionale della Società Italiana di Psicofisiologia*, Florence, 27-29 November 2014.
4. Invited lecture on “Mani e Robot” at the regional event “Pianeta Galileo”, organized by Regione Toscana in Firenze, October 28, 2014.
5. Invited lecture on “Tecnologie per l’accessibilità” at the conference on “Turismo accessibile esperienze a confronto”, organized by Tuscaneasy in Cortona (AR), May 2014.

6. Invited lecture on “Il controllo delle sinergie sensoriomotorie della mano” at the *XX Congresso Nazionale della Società Italiana di Psicofisiologia*, Venice, 22-24 November 2012.
7. Invited lecture on “Surgical robotics” at the Conference Robotica 2012 in Fiera di Milano, November 2012.
8. Invited lecture on “Robotica e Medicina” at the *Quarto Forum Risk Management in Sanità*, Centro Affari e Convegni, Arezzo, 24-27 November 2009.
9. Invited lecture on “Human grasp: high realism visuo-haptic simulation for medical applications” at the conference *La medicina incontra la realtà virtuale*, Università di Roma Tor Vergata, October 2008.
10. Invited lecture on “Robotica e Medicina: Interazione tattile con oggetti virtuali ed applicazioni alla medicina” at Congresso Nazionale della Società Italiana di Neurofisiologia Clinica (SINC), Roma, May 2005.
11. Invited Lecture on “Analisi dei Meccanismi della Presa Umana” at 5° Convegno Tecnico Scientifico di MIMOS, Turin, 3-5 November 2005.

6.6.4 University of Siena

1. Invited lecture “Robotica Indossabile e Applicazioni in Sanità ” at the *Aperidee sulla Sanità*, Università di Siena, Sept. 30 2014.
2. Invited lecture “Accessibilità inclusiva per non vedenti” at the *Mobility Management e Monilità Sostenibile*, Università di Siena, Sept. 16 2014.
3. Invited lecture “Tecnologie robotiche per l’interazione tattile” at the *Gioranata di Inaugurazione del Laboratorio sull’Accessibilità Universale*, Università di Siena, 2008.
4. Lectio Magistralis on “Nuove tecnologie per la comunicazione e la realtà virtuale” within the *Progetto Nuovi Per-Corsi di Qualità* ’Università di Siena, 2007.
5. Invited lecture on “Didattica attraverso Internet e Modelli di Interazione Sociale in Second Life, il ruolo della Robotica” at the *Worskhop su Digital Divide e Web 2.0, una Sfida per la Didattica*, Siena, September 2007.

6.6.5 TEDx Conferences, la Repubblica NEXT and EXPO 2015

1. Invited speaker on “Wearable and assistve robotics” at the event *Expand your Vision* organized by ABB Robotics and Automation at the EXPO 2015 in Milan, July 8, 2015.
2. Invited speaker on “Wearable technology for the sense of touch” at the TEDxRome event, independently organized **TED** event, Rome, February 2014.
<http://tinyurl.com/prattichizzo-tedx>
3. Invited speaker on “Robotica indossabile” at the **Repubblica-NEXT** La Repubblica delle Idee organized in Siena on June 2014.
<http://tinyurl.com/prattichizzo-rnext>
4. Invited Editor (Curatore Scientifico) to the TEDMED initiative “Call For Brain” in Milano, September 2014.
5. Invited speaker on “Wearable robotics for humans” at the Fondazione Stensen within the initiative Novembre Stenseniano 2015, But, Chip, Web, la Rivoluzione Digitale. November 24, 2015.

6.7 Scientific committees of international conferences

6.7.1 Chair of international conferences

1. **Technical Program Committee Chair** of the conference *IEEE Research and Rechnologies for Society and Industry*, Turin, Italy, 2015.
2. **Area Chair** of the conference *Robotics Science and Systems (RSS) 2015*, Rome, 2015.
3. **Area Chair** of the conference *Robotics Science and Systems (RSS) 2014*, Berkeley, California, USA, 2014.
4. **Program Co-Chair** with Robert Howe of the Conference *IEEE World Haptics* Pisa, Italy, March 2005.
5. **Co-Chair** of *Second IEEE Control Systems Society (CSS), IEEE Robotics and Automation Society (RAS) and EURON International Workshop on Control Problems in Robotics and Automation*, Las Vegas, December 2002.

6.7.2 Editorial boards of international conferences

1. Member of the Organizing Committee of *the Joint Workshop of New Technologies for Robotic Assisted Surgery (CRAS)*, 2015.
2. Associate Editor of the Conference Editorial Board of *IEEE International Conference on Robotics and Automation (ICRA)*, 2015.
3. Associate Editor of the Conference Editorial Board of *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2014.
4. Associate Editor of the Conference Editorial Board of *IEEE World Haptics Conference*, 2013.
5. Associate Editor of the Conference Editorial Board of *IEEE International Conference on Robotics and Automation*, 2013.
6. Associate Editor of the Conference Editorial Board of *IEEE International Conference on Intelligent Robots and Systems*, 2013.
7. Associate Editor of the Conference Editorial Board of *IEEE World Haptics Conference*, 2012.
8. Associate Editor of the Conference Editorial Board of *IEEE International Conference on Robotics and Automation*, 2012.
9. Associate Editor of the Conference Editorial *IEEE World Haptics Conference*, 2008.
10. Associate Editor of the *Conference Editorial Board* (CDC, ACC, CCA) of Control System Society, 2001–2006.
11. Associate Editor of *Eurographics*, 2005.

6.7.3 Workshops at international conferences

1. Co-Organizer with Claudio Pacchierotti and Katherine Kuchenbecker of the Workshop “Cutaneous Feedback for Teleoperation in Medical Robotics”, at the IEEE World Haptics Conference, Chicago, Illinois, June 2015.
2. Co-Organizer with Miguel Otadur and Antonio Frisoli of the Workshop “Wearable Haptics”, at the IEEE World Haptics Conference, Chicago, Illinois, June 2015.
3. Co-Organizer with Antonio Frisoli e Marcia K. O’Malley of the Workshop “Wearable haptics: from neurophysiology foundations to new wearable haptic designs and exoskeletons”, IEEE Haptics Symposium, Houston, Texas, February 2014.
4. Co-Organizer with Simone Rossi of the “2nd Workshop on Robotics and Neuroscience” University of Siena, May 2012.
5. Co-Organizer with Gian Luca Mariottini and Popa Dan of the “Workshop on Robotics in Assistive Environments” in la 5th PETRA Conference, Crete, Greece. 2012.
6. Co-Organizer with Cristian Secchi, Paolo Robuffo Giordano and Antonio Franchi of the Workshop on “Haptic Teleoperation of Mobile Robots: Theory, Applications and Perspectives”, ICRA 2012 St. Paul Minnesota. May 2012.
7. Co-Organizer with Simone Rossi of the Workshop on “Robotics and Neuroscience” University of Siena, December 2004.
8. Co-Organizer with J.K. Salisbury and F. Barbagli of the *ICRA workshop on Multi-point Interaction in Robotics and Virtual Reality* New Orleans, Usa. April 27, 2004.

6.7.4 Program committees

1. Member of Program Committee of the 4th Joint Workshop on New Technologies for Computer/Robot Assisted Surgery, CRAS 2014, Genoa, Italy, October 2014.
2. Member of Program Committee of Eurohaptics 2014, Versailles, France, June 2014.
3. Member of Program Committee of the 13th International Conference On Intelligent Autonomous Systems, IAS-13, Padova, Italy, July 2013.
4. Member of the Scientific Review Committee of The International Conference on Rehabilitation Robotics, ICORR 2013, Seattle, Washington, USA, June 2013.
5. Member of Program Committee of the RSS’12 Workshop on Mobile Manipulation, Sydney, Australia, July 2012.
6. Member of Program Committee of the RSS’11 - Robotics: Science and Systems 2011, University of Southern California, Los Angeles, USA, July 2011.
7. Member of Program Committee of the IEEE International Workshop on Robots and Human Interactive Communications (ROMAN) 2005, 2010, 2011.
8. Member of Program Committee of the HAVE 2010 - IEEE Workshop on Haptic Audio Visual Environments and Games 2010, Phoenix, Arizona, October 2010.
9. Member of Program Committee of the RSS’10 - Robotics: Science and Systems 2010, Zaragoza, Spain, July 2010.
10. Member of Program Committee of the Hamlyn Symposium, London, May 2010 and Italy, August 2010.

11. Member of Program Committee of the Workshop on Omnidirectional Robot Vision, Anchorage, Alaska, USA, May 2010.
12. Member of Program Committee of the IEEE RSJ RO-MAN International Symposium on Robot and Human Interactive Communication, Viareggio, Italy, August 2010.
13. Member of Program Committee of the First Workshop on Omnidirectional Robot Vision, Venice, Italy 2009.
14. Member of Program Committee of the RSS'08 - Robotics: Science and Systems 2008, ETH Zurich, Switzerland, June, 2008.
15. Member of Program Committee of the RSS'07 - Robotics: Science and Systems 2007, Georgia Institute of Technology in Atlanta (GA), USA, June 2007.
16. Member of Program Committee of the IEEE RSJ RO-MAN International Symposium on Robot and Human Interactive Communication, Jeju, Korea, August 2007.
17. Member of Program Committee of the RSS'06 - Robotics: Science and Systems 2006, University of Pennsylvania, Philadelphia, Pennsylvania, USA, August 2006.
18. Member of National Organizing Committee and of Program Committee of the 8th IFAC Symposium on Robot Control, SYROCO'06, Bologna, Italy, September, 2006.
19. Member of Program Committee of the 14th Mediterranean Conference on Control Application MED'05. Ancona, Italy, 2005.
20. Member of Program Committee of the ENACTIVE'05, Genoa, Italy, 2005.
21. Member of Program Committee of the IEEE International Conference on Robotics and Automation, Barcellona, Spain, 2005 and New Orleans, France, 2004.
22. Member of Program Committee of the IEEE/RSJ International Symposium on Intelligent Robots and Systems, Beijing, China, 2006, Edmonton, Canada, 2005, Las Vegas, USA, 2003.
23. Member of Program Committee of the 2nd International Conference on Non-visual & Multimodal Visualization, London, UK, July 2005.
24. Member of Program Committee of the IEEE International Workshop on Robots and Human Interactive Communications (ROMAN), Nashville, USA. 2005.
25. Member of the Organizing Committee of the Third International DCDIS Conference on Engineering Applications and Computational Algorithms, Guelph , Ontario, Canada, May, 2003.
26. Member of the Scientific and Organizing Committee of the 1st International Leric Winter School on Marine Technologies: Autonomous and Remotely Operated Vehicles, Leric (Italy), January 2002.

6.7.5 SIDRA

1. Program Committee Member of *Convegno Annuale dei Docenti e Ricercatori in Automatica 2015 (SIDRA)*, Bari 2015.
- 16
2. Organizer of sessions on Robotics in *Convegno Nazionale SIDRA*, Siracusa 2009.
3. Organizer of sessions on Robotics in *Convegno Nazionale SIDRA*, Vicenza 2008.

4. Co-Organizer with G. Fiengo, L. Glielmo e S. Santaniello of the invited session on “Modellistica, controllo ed ottimizzazione di sistemi per le Neuroscienze, la Neuroriabilitazione e la Robotica medicale” in *Convegno Nazionale SIDRA*, Vicenza 2008.

7 Teaching activity

7.1 Bachelor's (laurea) and master of science's (laurea magistrale e specialistica) degree courses

The term *Director* refers to the formal responsibility of the course.

7.1.1 Master of science

- Director of [6 credits, 60 hours] “Human Centered Robotics” in *Corso di Laurea Magistrale in Ingegneria Informatica*.
Academic Years: 2014/2015 (Assigned) - 2013/2014 - 2012/2013
- Director of [6 credits, 60 hours] “Robotica: percezione e interazione” in *Corso di Laurea Specialistica in Ingegneria Informatica*.
Academic Years: 2012/2013 - 2011/2012 - 2010/2011
- Director of [6 credits, 60 hours] “Robotica e Visione” in *Corso di Laurea Specialistica in Ingegneria Informatica*.
Academic Years: 2009/2010 - 2008/2009 - 2007/2008 - 2006/2007 - 2005/2006 - 2004/2005 - 2003/2004

7.1.2 Bachelor

- Director of [6 credits, 60 hours] “Robotica” in *Corso di Laurea in Ingegneria Informatica*.
Academic Years: 2014/2015 (Assigned) - 2013/2014 - 2012/2013 - 2011/2012
- Director of [6 credits, 60 hours] “Robotica e Automazione di Processi” in *Corso di Laurea in Ingegneria Informatica*.
Academic Years: 2010/2011 - 2009/2010 - 2008/2009 - 2007/2008 - 2006/2007 - 2005/2006 - 2004/2005 - 2003/2004 - 2002/2003 - 2001/2002
- Director of [9 credits, 80 hours] “Sistemi dinamici” in *Corso di Laurea in Ingegneria delle Telecomunicazioni, Ingegneria Gestionale ed Ingegneria Informatica*.
Academic Years: 2011/2012 - 2010/2011
- Director of [6 credits, 60 hours] “Fondamenti di Automatica” in *Corso di Laurea in Ingegneria delle Telecomunicazioni, Ingegneria Gestionale ed Ingegneria Informatica*.
Academic Year: 2008/2009 - 2007/2008 - 2006/2007 - 2005/2006 - 2004/2005 - 2003/2004 - 2002/2003 - 2001/2002
- Director of [4 credits, 40-50 hours] “Complementi di Controllo dei Processi” in *Corso di Laurea in Ingegneria Informatica*.
Academic Years: 2003/2004 - 2002/2003
- Director of [4 credits, 40-50 hours] (Academic Year: 2001/2002) “Complementi di Robotica e Automazione di Processo” in *Corso di Laurea in Ingegneria Informatica*.
- Director of [2 credits, 20 hours] “Laboratorio di Robotica e Realtà Virtuale” in *Facoltà di Ingegneria dell'Università di Siena*.
Academic Years: 2005/2006 - 2004/2005 - 2003/2004 - 2002/2003

7.1.3 Five-years master of science courses (corsi di laurea - prima della riforma)

- Director of (Academic Year: 2000/2001) “Fondamenti di Automatica,” in *Laurea in Ingegneria Informatica ed Ingegneria delle Telecomunicazioni* Università di Siena (100 hours).
- Director of (Academic Years: 1999/2000 and 2000/2001) of “Controllo dei Processi,” in *Laurea in Ingegneria Informatica* Università di Siena (100 hours).

7.1.4 Three-years bachelor courses (corsi di diploma - prima della riforma)

- Director of (Articolo 100 DPR 382/80) (Academic Years 1994/1995 e 1995/1996) (60 hours) “Teoria dei Sistemi” in *Corso di Diploma in Ingegneria Informatica e Automatica and Ingegneria delle Telecomunicazioni of the Facoltà di Ingegneria dell’Università degli Studi di Siena*.
- Director of (Articolo 100 DPR 382/80) (Academic Year 1995/1996) (60 hours) “Strumentazione e Misure per l’Automazione” in *Corso di Diploma in Ingegneria Informatica e Automatica and Ingegneria delle Telecomunicazioni of the Facoltà di Ingegneria dell’Università degli Studi di Siena*.

7.2 Formal responsibility of PhD courses

7.2.1 Organizing activities

- Co-organizer with L. Villani and G. Oriolo and professor of the 2010 SIDRA PhD School on *Robotics*, Bertinoro (FC), 2010.
- Organizer and professor of the PhD Course (30 hours) on *Haptics e Medicine* organized by ’Università di Siena and by Scuola di Studi Superiore “S. Anna” of Pisa and held in Siena, October 2007.
- Coordinator of the part on *Visual Servoing* for the 2003 CIRA PhD School , Bertinoro (FC), 2003.
- Organizer and professor of the PhD course (30 hours) on Advanced Robotic Grasping organized by Università di Siena, October 2012.

7.2.2 Teaching

- Professor of the short-course (6 hours) *Wearable Haptics for Humans and Robots* in both 2014 and 2015 Virtual Prototyping Summer Schools, Politecnico di Milano, 2014 and 2015.
- Professor of the short-course (6 hours) *From grounded to wearable haptics: design principles and applications* in 2013 Virtual Prototyping Summer School, Politecnico di Milano, 2013.
- Professor of the short-course on *Dispositivi a immersione cineto-statica (haptics)* in *Scuola di Dottorato in Automatica CIRA 2003*, Bertinoro (FC), 2003.
- Professor of the short-course on *Controllo con asservimenti visivi* in *Scuola di Dottorato in Automatica CIRA 2003*, Bertinoro (FC), 2003.
- Professor of the short-course on *Controllo Geometrico* in *Scuola di Dottorato in Automatica CIRA 2002*. Bertinoro (FC), 2002.
- Professor of a short-course of 8 hours on “haptics and medical robotics” in the PhD Course on Medical Robotics organized by the Politecnico di Milano May 2011.

- Short-course on “Robotics, hands and haptic interfaces” at the Università degli Studi di Bologna within the PhD program in Robotics, January 2010.

7.3 Formal responsibility of specializing master’s and life learning courses

- Director of “Computational Tools” [25 hours] in the Specializing Master in *Economia Digitale e E-business* of the Università di Siena.
Academic Years: Academic Years: 2004/2005 - 2004/2003 - 2003/2002
- Director of the 8 hours course on “Visual Servoing” in the specializing master “IMROB, International Master in Robotics”. Academic Year 2006/2007 at the Università di Genova.
- Director of the 8-hours course on Robotic Assisted Surgery in Master on *Elaborazione informatica di dati biomedici e telecontrollo in medicina* at the Università di Verona.
Academic Years: 2007/2008 - 2006/2007 - 2005/2006
- Director of “Informatica e telematica: consolidamento informatica di base; reti e sistemi di comunicazione” of the Life Learning Modulo Professionalizzante A.A. 2003-2004 in “Operatore Sanitario esperto in Telemedicina” Università degli Studi di Siena supported by the *Regione Toscana* and *Fondo Sociale Europeo*
- Director of a 8 hours course on “Haptic technologies and ultrasound imaging” in *l’Educazione Continua in Medicina* organized within the Summer School on Medical Robotics at Università di Roma Tor Vergata (villa Mondragone a Frascati), May 2003.
- Professor of the 8 hours course on *Haptics technologies for medicine* at the *Master Universitario di II livello* Robotics and Intelligent Systems, organized by the Università degli Studi di Napoli, Federico II, July 2011.

8 Institutional offices and roles in italian and foreign universities

8.1 Institutional offices in foreign examining committees

1. Member of the **Evaluation Committee** for the Habilitation Degree of Houxiang Zhang, University of Hamburg, **Germany** 2010.

8.2 Institutional offices in national examining committees

8.2.1 Associate and assistant professors

1. Member of the **Commissione Giudicatrice per la procedura di valutazione comparativa a n. 1 posto di Ricercatore** (selection of Assistant Professor) in the Academic Discipline ING-INF/04 at the Facoltà di Ingegneria dell'Università di Roma Tor Vergata, 2008.
2. Member of **Commissione per la Conferma di Professori Associati - S.S.D. ING-INF/04** (tenior committee) for the candidate Prof. G.L. Santosuosso, University of Roma Tor Vergata, October 2007
3. Member of **Commissione per la Conferma di Professori Associati - S.S.D. ING-INF/04** (tenior committee) for the candidate Prof. D. Angeli, University of Roma Tor Vergata, October 2009

8.2.2 PhD examining committee of foreign universities

1. Member of the Examining Committee for the PhD Thesis Defense for the candidate Mrs. Beatriz Elena Leon Pinzon, supervised by Antonio Morales Escrig, with the Thesis "From robot to human grasping simulation". l'Universitat Jaume I, Dep. d'Enginyeria i Ciència dels Computadors, Valencia, May 2013.
2. Member of the Examining Committee for the PhD Thesis Defense at the Università Politecnica della Catalonia, for the Thesis "Grasp Planning under Task-specific Contact Constraints". Candidate: Mr. Carlos Rosales Gallegos supervised by Dr. Raul Suarez. Barcelona, January 2013.
3. Member of the Examining Committee for the PhD Thesis Defense at l'Università Politecnica della Catalonia, for the Thesis "Haptics illusion in virtual environments" by Andrea Brogni, supervised by Mel Slater. Barcellona, July 2011.
4. Member of the Examining Committee for the PhD Thesis Defense at the Departament d'Enginyeria I Ciències dels Computadors Universitat Jaume I, Castello. for the. Thesis "Visual determination, tracking and execution of 2D grasps using a behavior-inspired approach" presented by Gabriel Recatal Ballester and supervised by: Pedro Jose Sanz Valero, Angel Pascual del Pobil y Ferre and Enric Cervera Mateu. Valencia, October 2003.

8.2.3 PhD examining committee in italian universities

1. Member of the Examining Committee for the PhD Thesis Defense for the PhD School in Design, Politecnico di Milano, Milano. November 25 2014.

2. Member of the Examining Committee for the PhD Thesis Defense for the PhD School in Automation, Robotics e Bioengineering. Università di Pisa. June 2011.
3. Member of the Examining Committee for the PhD Thesis Defense for the PhD School in *Informatica e Telecomunicazioni*. Università di Trento. April 2011.
4. Member of the Examining Committee for the PhD Thesis Defense for the PhD School of the Istituto Italiano di Tecnologia in Genova (Ciclo XXII), April 2010.
5. Member of the Examining Committee for the PhD Thesis Defense for the PhD School in Non Linear Dynamics and Complex Systems. Università di Firenze (ciclo XX). April 2008.
6. Member of the Examining Committee for the PhD Thesis Defense for the PhD School in Automation Robotics and Bioengineering of the Università di Pisa (ciclo XX). May 2007.
7. Member of the Examining Committee for the PhD Thesis Defense for the PhD School in Automatica e Ricerca Operativa. Università di Padova (ciclo XIX). January 2006.
8. Member of the Examining Committee for the PhD Thesis Defense for the PhD School in Automatica, Robotica e Bioingegneria. Università di Pisa (ciclo XVIII). Aprile 2006.
9. Member of the Examining Committee for the PhD Thesis Defense for the PhD School in Ingegneria dell'Informazione. Università di Napoli "Federico II". March 2004.
10. Member of the Examining Committee for the PhD Thesis Defense for the PhD School in Automatica e Ricerca Operativa (XVI ciclo). 'Università di Padova. February 2004.
11. Member of the Examining Committee for the PhD Thesis Defense for the PhD School in Automatica, Robotica e Bioingegneria (XV e XVI ciclo). Università di Pisa. Luglio 2004.

8.2.4 PhD students and Post-Docs candidates evaluation at University of Siena

1. Member of several *Evaluation Committees* for admission of PhD students and Post-Docs at the University of Siena in the field of Robotics and Automation.
2. Member of several Evaluation Committees for Post Docs in 2014, 2013, 2012, 2011, 2010, 2008, 2007, 2005, 2003 and 2002 at the University of Siena.
3. Member of Committees for PhD student candidate Evaluation in 2003 and 2012 at the University of Siena.

8.3 Institutional offices at the University of Siena in *commissioni di Ateneo*

1. Member of the *Commissione di Ateneo Biblioteche* to manage all the libraries of the Università degli Studi di Siena from 2004 to 2012.
2. Member of the *Commissione di Ateneo* for the funding distribution of the Libraries of the Università degli Studi di Siena from 2007 to 2011.
3. Appointed by the *Consiglio di Facoltà* for representing the Engineering Faculty, Università degli Studi di Siena, in *Progetto di Ateneo Per-Corsi di Qualità dell'Università di Siena*, 2000-2005.
4. Member of the *Commissione Orientamento e Tutorato di Ateneo* of the Università degli Studi di Siena from 2002 to 2005.

8.4 Institutional offices at the department and faculty of the University of Siena and other Italian universities

8.4.1 PhD

1. Member of the PhD Committee (*Collegio dei Docenti*) of the PhD program in *Information Engineering and Mathematics*, Università degli Studi di Siena. 2010-present.
2. Member of the PhD Committee of the PhD program in *Automatica, Robotica e Bioingegneria*, Università di Pisa, from September 2002 to January 2004.

8.4.2 Master and bachelor

3. Member of the *Comitato della Didattica* of the Master of Science in Ingegneria Informatica in Università degli Studi di Siena, from 2009 to 2013.
4. Appointed by the *Consiglio di Facoltà* as *Garante del Corso di Laurea* in Ingegneria Gestionale. 2008-2009.
5. Member of the *Comitato della Didattica* of the Bachelor in Ingegneria Gestionale in Università degli Studi di Siena, from 2002 to 2009.
6. Member of the *Comitato della Didattica* of the Master of Science in Ingegneria Informatica e dell'Informazione in Università degli Studi di Siena, from 2002 to 2009.
7. Member of the *Comitato della Didattica* of the Master of Science in Ingegneria delle Comunicazioni in Università degli Studi di Siena, from 1999 to 2002.
8. Appointed by the *Consiglio di Facoltà* as member of the *Comitato di Indirizzo* of the Corso di Laurea in Ingegneria Informatica. 2001-2002.

8.5 Management roles in universities as part of faculty and department duties

1. Member of the *Giunta di Dipartimento* of the Dipartimento di Ingegneria dell'Informazione dell'Università degli Studi di Siena from 1999 to 2002.
2. Chair of the *Consiglio di Biblioteca* of the Engineering Faculty, Università degli Studi di Siena, from 2004 to 2012.
3. Member of the *Consiglio della Biblioteca* of the Engineering Faculty, Università degli Studi di Siena, from 1999 to 2004.
4. Member of the *Commissione Edilizia* of the Dipartimento di Ingegneria dell'Informazione, Università degli Studi di Siena, from May 2007 to 2009.
5. Member of the *Commissione Orientamento* of the Engineering Faculty, Università degli Studi di Siena from 1999 to 2005.

8.6 Offices in the governing bodies

8.6.1 At regional level

1. Co-founder with B. Allotta, M. Bergamasco, A. Bicchi, A. Caiti and P. Dario of "ROOTS: Robotics in Tuscany", a board to coordinate and promote the cooperation in the Tuscany Region of all the center of research with technology transfer aims in robotics.

<http://www.robotics-in-tuscany.eu>

2. Appointed by the Università di Siena to represent the Ateneo in the *Distretto di ICT e Robotica* of the Tuscan Region, 2012-present.
3. Member of the board of governors of the *Cluster di Automazione e Robotica* of the Polo di Innovazione ICT-Robotica of the Tuscan Region, 2012-present.

8.6.2 At the University of Siena

1. Organizer with companies PRAMAC and ORACLE Italia of a workshop on “Gestione globale della supply chain”, May 2008, Università di Siena.
2. Organizer of a full day workshop for the SMEs and the Universities on *Automazione, Gestione, Logistica: problemi e soluzioni nella piccola e media impresa*. Università di Siena, June 2002.
3. Organizer with the Liaison Office of the University of Siena and il *Ministero delle Attività Produttive* of a full day workshop on *La tutela dell'innovazione tecnologica, brevetti e marchi*, Università di Siena, May 2002.

9 Complete List of Publications

Refer to [the google scholar page](#)