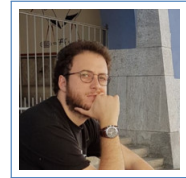


# Cosimo Della Santina

## Curriculum Vitae

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### Main Scientific Interests

**Dynamic Control of Soft Robots.**  
**Soft Robotic Hands, Modelling, Design, Control.**

### Education

#### Visiting PhD Student

Period **October 2017 - Current.**  
Institution **MIT - CSAIL, Cambridge MA, USA.**  
Tutor: Prof. Daniela Rus

#### Visiting PhD Student

Period **May 2017 - July 2017.**  
Institution **DLR Institute of Robotics and Mechatronics, Wessling, Germany.**  
Tutors: Prof. Alin Albu Schaeffer

#### PhD Student

Period **November 2015 - Current.**  
Institution **Centro E. Piaggio, University of Pisa, 56120, Pisa (PI), Italy.**  
Tutors: Prof. Antonio Bicchi, Prof. Lucia Pallottino

Teaching Experience Teaching assistant for the courses "Foundations of Automatic Control" (Bs in Mechanical Engineering, University of Pisa) and "Robot Control" (Ms in Robotics Engineering, University of Pisa).

#### Master Degree in Robotics and Automation Engineering

Period **October 2011 - October 2014.**  
Institution **University of Pisa, Pisa, Italy.**  
Final Score **110 Magna cum Laude, with meritorious mention.**  
Average **30,4/30.**

Dissertation titled **Control architecture for natural motion in soft robots, Tutor: Prof. Antonio Bicchi.**

#### Bachelor Degree in Computer Engineering

Period **September 2008 - October 2011.**  
Institution **University of Pisa, Pisa, Italy.**  
Final Score **110 Magna cum Laude, with meritorious mention.**  
Average **29,4/30.**

Dissertation titled **Development of a testbed for distributed control of autonomous vehicles, Tutors: Prof. Mario Innocenti, Prof. Lorenzo Pollini.**

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## Professional Experiences

- 1/10/2014 - **Research Assistant**, *Centro E. Piaggio, University of Pisa*, Tutor: Prof. Antonio Bicchi, University of Pisa.  
1/11/2015
- 15/7/2013 - **Computer Engineer**, *CERN Laboratories, Geneva, Switzerland*, Tutor: Dr. Alberto Annovi, INFN Frascati.  
31/8/2013
- 1/8/2012 - **Computer Engineer**, *Fermilab Particle Physics Laboratories, Batavia, Illinois, USA*,  
4/10/2012 Tutor: Prof. Eric D. Church, Yale University.

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## Languages

**Italian**, *Mother Tongue*.  
**English**, *C1 (CEF-Level)*.

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## Awards

- Best Robotics Paper, Best Student Paper**, *Averta, Della Santina et al. "From Humans to Robots: the Role of Cutaneous Impairment in Human Environmental Constraint Exploitation to Inform the Design of Robotic Hands"*, *9th International Congress on Ultra Modern Telecommunications and Control Systems (ICUMT)*, November 6 - 8 2017.
- Member of the winning team**, *Robotic Grasping and Manipulation Competition IROS2016 - Hand-by-hand track*, 2016.
- Travel and Stay Support**, *for attending EECI Graduate School on Control*, 2016,2017.
- Best Interactive Paper**, *Della Santina et al. "Dexterity augmentation on a synergistic hand: the Pisa/IIT SoftHand+"*, *15th IEEE RAS Humanoids Conference, Seoul, Korea*, November 3 - 5 2015.
- Top Rank Student Support**, *University of Pisa, 2008-2013*.

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## Book chapters

**Manuel Bonilla, Cosimo Della Santina, et al. "Advanced Grasping with the Pisa/IIT SoftHand"**, *Springer Book "Robotic Grasping and Manipulation Competition - IROS 2016"*, 2018.

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## Journal papers

- Cosimo Della Santina, Cristina Piazza, Giorgio Grioli, Manuel Catalano, Antonio Bicchi "Towards Dexterous Manipulation with Augmented Adaptive Synergies: the Pisa/IIT SoftHand 2"**, *Under Review, IEEE Transaction on Robotics*, 2018.
- Franco Angelini, Cosimo Della Santina, Garabini Manolo, Matteo Bianchi, Gian Maria Gasparri, Giorgio Grioli, Manuel Catalano, Antonio Bicchi "Decentralized Trajectory Tracking Control for Soft Robots Interacting with the Environment"**, *Accepted by IEEE Transaction on Robotics*, 2018.
- Cosimo Della Santina, Matteo Bianchi, Giorgio Grioli, Franco Angelini, Manuel Catalano, Garabini Manolo, Antonio Bicchi "Controlling soft robots: balancing feedback and feedforward elements"**, *IEEE Robotics & Automation Magazine*, September 2017.

Cosimo Della Santina, Matteo Bianchi, Giuseppe Averta, Simone Ciotti, Visar Arapi, Simone Fani, Edoardo Battaglia, Manuel Giuseppe Catalano, Marco Santello, Antonio Bicchi "Postural Hand Synergies during Environmental Constraint Exploitation", *Frontiers in neurorobotics*, August 2017.

Giuseppe Averta, Cosimo Della Santina, Edoardo Battaglia, Federica Felici, Matteo Bianchi, Antonio Bicchi "Unveiling the principal modes of human upper limb movements through functional analysis", *Frontiers in neurorobotics*, August 2017.

Cosimo Della Santina, Cristina Piazza, Gian Maria Gasparri, Manuel Catalano, Giorgio Grioli, Garabini Manolo, Antonio Bicchi "The Quest for Natural Machine Motion: An Open Platform to Fast-Prototyping Articulated Soft Robots", *IEEE Robotics & Automation Magazine*, March 2017.

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## Conference papers

Cosimo Della Santina, Robert Kevin Katzschmann, Antonio Bicchi, Daniela Rus "Dynamic Control of Soft Robots Interacting with the Environment", *1st IEEE-RAS international conference on Soft Robotics*, April 2018.

Giuseppe Averta, Cosimo Della Santina, Edoardo Battaglia, Simone Ciotti, Visar Arapi, Simone Fani, Matteo Bianchi "From Humans to Robots: the Role of Cutaneous Impairment in Human Environmental Constraint Exploitation to Inform the Design of Robotic Hands", *9th International Congress on Ultra Modern Telecommunications and Control Systems (ICUMT)*, November 6 - 8 2017.

Cosimo Della Santina, Cristina Piazza, Gaspare Santaera, Giorgio Grioli, Manuel Catalano, Antonio Bicchi "Estimating Contact Forces from Postural Measures in a class of Under-Actuated Robotic Hands", *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, September 24-28, 2018.

Sariah Mghames, Marco Laghi, Cosimo Della Santina, Manolo Garabini, Manuel Catalano, Giorgio Grioli, Antonio Bicchi "Design, control and validation of the variable stiffness exoskeleton FLExo", *International Conference on Rehabilitation Robotics (ICORR)*, July 17, 2017.

Matteo Rossi, Cosimo Della Santina, Cristina Piazza, Giorgio Grioli, Manuel Catalano, Antonio Bicchi "Preliminary results toward a naturally controlled multi-synergistic prosthetic hand", *International Conference on Rehabilitation Robotics (ICORR)*, July 17, 2017.

Ivan Herreros, Xerxes D Arsiwalla, Cosimo Della Santina, Jordi-Ysard Puigbo, Antonio Bicchi, Paul Verschure "Cerebellar-inspired learning rule for gain adaptation of feedback controllers", *25th Mediterranean Conference on Control and Automation (MED)*, July 3, 2017.

Tobia Marcucci, Cosimo Della Santina, Marco Gabiccini, Antonio Bicchi "Towards Minimum-Information Adaptive Controllers for Robot Manipulators", *2017 American Control Conference*, May 24-26, 2017.

Simona Casini, Vinicio Tincani, Giuseppe Averta, Mattia Poggiani, Cosimo Della Santina, Edoardo Battaglia, Manuel Giuseppe Catalano, Matteo Bianchi, Giorgio Grioli, Antonio Bicchi "Design of an under-actuated wrist based on adaptive synergies", *2017 IEEE International Conference on Robotics and Automation*, June 2017.

Cristina Piazza, Cosimo Della Santina, Gian Maria Gasparri, Manuel Catalano, Giorgio Grioli, Manolo Garabini, Antonio Bicchi "Toward an Adaptive Foot for Natural Walking", *16th IEEE RAS Humanoids Conference, Seoul, Mexico*, November 15-17 2016.

Manolo Garabini, Cosimo Della Santina, Matteo Bianchi, Manuel Catalano, Giorgio Grioli, Antonio Bicchi "Soft robots that mimic the neuromusculoskeletal system", *Proceeding of the International Conference on NeuroRehabilitation*, October 2016.

Cristina Piazza, Cosimo Della Santina, Manuel Catalano, Giorgio Grioli, Manolo Garabini, Antonio Bicchi "SoftHand Pro-D: Matching Dynamic Content of Natural User Commands with Hand Embodiment for Enhanced Prosthesis Control", *IEEE RAS International Conference on Robotics and Automation, Stockholm, Sweden*, May 16-21 2016.

Cosimo Della Santina, Giorgio Grioli, Manuel Catalano, Alberto Brando, Antonio Bicchi "Dexterity augmentation on a synergistic hand: the Pisa/IIT SoftHand+", *15th IEEE RAS Humanoids Conference, Seoul, Korea*, November 3 - 5 2015.

Simone Nardi, Cosimo Della Santina, Daniele Meucci, Lucia Pallottino, "Dynamic coverage against asymmetric threats: a game theoretic approach", *Oceans'15 MTS/IEEE Genova*, May 18 2015.

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## Workshop extended abstracts

Cristina Piazza, Cosimo Della Santina, Manuel Catalano, Giorgio Grioli, Manolo Garabini, Antonio Bicchi "Natural encoding of user intentions in a soft prosthesis using dynamic synergies", *Human Friendly Robotics Genoa*, September 29-30 2016.

Cosimo Della Santina, Cristina Piazza, Giorgio Grioli, Manuel Catalano, Antonio Bicchi "Dexterity augmentation on a synergistic hand", *workshop on "Exploiting contact and dynamics in manipulation" - IEEE RAS International Conference on Robotics and Automation, Stockholm, Sweden*, May 16-21 2016.

Cosimo Della Santina, Matteo Bianchi, Manolo Garabini, Antonio Bicchi "Control architecture for human-Like motion with application to soft robotics", *Human Friendly Robotics Munich*, October 21-23 2015.

Cosimo Della Santina, Matteo Bianchi, Manolo Garabini, Antonio Bicchi "Control architecture for human-Like motion with application to soft robotics", *Progress in Motor Control X Budapest*, July 22-25 2015.