

**Simone Fani**  
**Curriculum Vitae - September 20, 2019**

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**Research interests**

Haptics, Tele-operation, Assistive robotics, Prosthesis, Medical robotics, Virtual and Augmented reality

**Affiliations**

**Information Engineering Department, University of Pisa**

Via Girolamo Caruso, 16

56122 Pisa (PI), Italy

**Research Center “E. Piaggio”, University of Pisa**

Largo Lucio Lazzarino, 1

56122 Pisa (PI), Italy

**Soft Robotics for Human Cooperation and Rehabilitation Research Line,**

**Istituto Italiano di Tecnologia**

Via Morego, 30

16163 Genoa (GE), Italy

**IEEE, Student Member**

**Education**

**Nov 2016 - Ongoing: Information Engineering Department, University of Pisa**

**PhD Student, Robotics and Automation Engineering**

**Advisors:** Dr. Matteo Bianchi, Prof. Antonio Bicchi

**Grant:** “Soft Robotics for Human Cooperation and Rehabilitation”, Fondazione Istituto Italiano di Tecnologia

**Expected Defense:** May 2020

**Description:** Study, development, assessment and testing with patients/users of haptic interfaces for tactile feedback for prosthetic and assistive applications, tele-operation, surgical robotics and virtual and augmented reality.

**Oct 2016: National professional qualification as Engineer (Industrial Engineer)**

**Oct 2011 - Nov 2015: University of Pisa**

**Master of Science, Robotics and Automation Engineering**

**Graduation:** November 26th, 2015, **110/110**

**Final weighted average:** 28.18/30

**Thesis Advisors:** Prof. Antonio Bicchi, Prof. Marco Santello, Dr. Matteo Bianchi

**Title:** *Design and Assessment of a Myoelectric Controller for Prosthetic and Assistive Applications*

Thesis work developed by the Neural Control of Movement Laboratory at the Arizona State University in collaboration with the research center Centro E. Piaggio of the University of Pisa and the Istituto Italiano di Tecnologia.

**Sep 2008 - Dec 2011: University of Siena**

**Bachelor of Science, Computer Science Engineering**

**Curriculum:** Robotics and Industrial Automation Systems

**Graduation:** December 15th, 2011, **110/110 cum Laude.**

**Final weighted average:** 29.02/30

**Thesis advisors:** Marco Casini, Andrea Garulli.

**Title:** *Algoritmi di Stima della Deambulazione Basati sui Dati Forniti da Piattaforme Inerziali* (Estimation algorithms of walking based on data from Inertial Measurement Units).

## Formation Experiences

- Jul 6-8, 2017: SIDRA 2017 PhD Summer School**, Bertinoro (FC), Italy  
*Port-Hamiltonian modelling and passivity-based control of physical systems. Theory and Applications*
- Sep 17-22, 2017: 2017 School and Symposium on Advanced Neurorehabilitation (SSNR2017)**, Baiona, Pontevedra, Spain

## Working experience

- Apr 2016 - Oct 2016: Research Center “Centro E. Piaggio” - University of Pisa**  
**Role:** Collaborator  
**Advisors:** Antonio Bicchi, Matteo Bianchi  
**Description:** Working within the European projects WEARHAP and SOFTPRO. Design and validation of user-machine wearable interfaces and haptic systems for the study of the human behavior, user-robot interactions and prosthetic and assistive applications

## International Experiences

- Mar 2015 - Sep 2015: Visiting Student**  
*Neural Control of Movement Laboratory, School of Biological and Health Systems Engineering, Ira A. Fulton Schools of Engineering, Arizona State University*  
Characterization of the robotic hand SoftHand Pro for prosthetic/assistive applications  
**Advisor:** Prof. Marco Santello
- Feb 2015 - Jul 2019: Visiting Ph.D. Student**  
*Re Touch Lab, Department of Electrical and Computer Engineering, University of California, Santa Barbara*  
Study of vibrations propagation for feedback system design  
**Advisor:** Prof. Yon Visell

## Participation in Research Projects

- Jul 2013 - Now:** Collaboration with Research Center “E. Piaggio” - University of Pisa within the following European projects:
- THE Hand Embodied**, European Commission Collaborative Project no. 248587, within the FP7-ICT-2009-4-2-1 “Cognitive Systems and Robotics” program (Ended Jul 2014).  
Specifically within the Work Packages  
WP2 – “Psychophysics of the hand”  
WP7 – “Haptic Interfaces”.
- WEARHAP - WEARable HAPtics for humans and robots**, European Commission Collaborative Project no. 601165, within the FP7-ICT-2011-9 “Cognitive Systems and Robotics” program (Ended Aug 2017).  
Specifically within the Work Packages  
WP1 – “Neuroscience and physiology: foundations for wearable haptic systems”  
WP4 – “Wearable and distributed multi-DoF haptic systems”  
WP6 – “Wearable haptics for human robot interaction and cooperation”.
- SOMA: Soft Manipulation**, European Commission Collaborative Project no. 645599, within the Horizon 2020 Framework program (2015 – 2019).  
Specifically within the Work Packages  
WP1 – “Human Grasping and Manipulation”.
- SoftPro: Synergy-based Open-source Foundations and Technologies for Prosthetics and Rehabilitation**, European Commission Collaborative Project no. 688857, within the Horizon 2020 Framework program (2016 – 2020).  
Specifically within the Work Packages

WP1 – “Fundamentals of Synergy-based Motor Control”

WP2 – “Interfaces: from Natural to Artificial”

WP3 – “Interfaces: from Artificial to Natural”.

**Jul 2014 - Feb 2015:** Collaboration with the Information Engineering Department - School of Engineering - University of Pisa within the following European project:

**EuRoC – European Robotic Challenges**, European Commission Collaborative Project no. 608849, within the FoF-ICT-2013.7.1 “Application experiments for robotics and simulation” program (2014 – 2017).

## Known languages

Italian, native.

English, fluent, with certifications

Mar 2008, CEFR B1 Intermediate Level, PET (University of Cambridge)

May 2015, CEFR C1 Advanced Level, EFSET (EF Education First)

Reading C1 Advanced

Listening C2 Proficient

March 2017, CEFR C1 Advanced Level, Centro Linguistico di Ateneo (University of Pisa)

French, good.

## Skills

### Operating Systems

Excellent knowledge of Windows, Linux/Unix.

### Programming and engineering software

Excellent knowledge of MATLAB, Simulink, Microsoft Visual Studio, PTC Creo, Dev-C++, C/C++

Good knowledge of ROS, Scilab, Wolfram Mathematica, Autocad, PSpice, Python, Qt, NI LabVIEW

### Animation and image processing software

Excellent knowledge of GIMP, Adobe Photoshop.

### Document preparation systems

Excellent knowledge of TeX (LaTeX, BibTeX), Microsoft Office.

### Rapid prototyping

CAD Design, 3D printing, workshop machinery (column drill, metal lathe, hand tools).

### Other skills

Project proposal and management, Studies involving healthy human subjects and patients, Students tutoring.

## Awards

### 2014: Eurohaptics Conference: Best Paper Award (Category: Poster Presentation)

*A change in the fingertip contact area induces an illusory displacement of the finger.* [1]

### 2017: ICUMT Conference: Best Paper Award (Track: Robotics)

#### ICUMT Conference: Best Student Paper Award

*From humans to robots: the role of cutaneous impairment in human environmental constraint exploitation to inform the design of robotic hands.* [6]

## Other certifications

March 9, 2013 - Fast and Safe-Driving, Level 1 Course Certificate

January, 2019 - Heartsaver AED Certificate

## Selected Publications

For a complete list: <https://goo.gl/zKk2av>

- [1] A. Moscatelli, M. Bianchi, A. Serio, O. Al Atassi, **S. Fani**, A. Terekhov, V. Hayward, M. Ernst, A. Bicchi (2014).  
A Change in the Fingertip Contact Area Induces an Illusory Displacement of the Finger.  
In *Haptics: Neuroscience, Devices, Modeling, and Applications: 9th International Conference, EuroHaptics 2014, Proceedings, Part II*, (pp. 72-79), Versailles, France, June 24-26, 2014.  
doi: 10.1007/978-3-662-44196-1\_10
- [2] S. Condino, R. M. Viglialoro, **S. Fani**, M. Bianchi, L. Morelli, M. Ferrari, A. Bicchi, V. Ferrari (2016, August).  
Tactile augmented reality for arteries palpation in open surgery training.  
In *Medical Imaging and Augmented Reality: 7th International Conference, MIAR 2016, Proceedings, Springer International Publishing* (pp. 186-197), Bern, Switzerland, August 24-26.  
doi: 10.1007/978-3-319-43775-0\_17
- [3] **S.Fani**, M. Bianchi, S. Jain, J.S. Pimenta Neto, S. Boege, G. Grioli, A. Bicchi, M. Santello (2016).  
Assessment of Myoelectric Controller Performance and Kinematic Behavior of a Novel Soft Synergy-inspired Robotic Hand for Prosthetic Applications.  
In *Frontiers in Neurorobotics* , 10:11. doi: 10.3389/fnbot.2016.00011
- [4] **S. Fani**, S. Ciotti, E. Battaglia, A. Moscatelli, M. Bianchi (2018).  
W-FYD: a Wearable Fabric-based Display for Haptic Multi-Cue Delivery and Tactile Augmented Reality.  
In *IEEE Transactions on Haptics, Volume 11, no. 2*, (pp. 304-316).  
doi: 10.1109/TOH.2017.2708717
- [5] G. Averta, C. Della Santina, E. Battaglia, S. Ciotti, V. Arapi, **S. Fani**, M. Bianchi (2017).  
From humans to robots: the role of cutaneous impairment in human environmental constraint exploitation to inform the design of robotic hands.  
In *Ultra Modern Telecommunications and Control Systems and Workshops (ICUMT), 2017 9th International Congress on* (pp. 179-184), Munich, Germany, November 6-8.  
doi: 10.1109/ICUMT.2017.8255117
- [6] **S. Fani**, S. Ciotti, M. G. Catalano, G. Grioli, A. Tognetti, G. Valenza, A. Ajoudani, M. Bianchi (2018).  
Simplifying Telerobotics: Wearability and Teleimpedance Improves Human-Robot Interactions in Teleoperation.  
In *IEEE Robotics Automation Magazine, Volume 25, no. 1*, (pp.77-88).  
doi: 10.1109/MRA.2017.2741579
- [7] E. Pezent, **S. Fani**, J. Bradley, M. Bianchi, M. K. O'Malley (2018).  
Separating haptic guidance from task dynamics: A practical solution via cutaneous devices.  
In *2018 IEEE Haptics Symposium (HAPTICS)*, San Francisco, CA, pp. 20-25.  
doi: 10.1109/HAPTICS.2018.8357147
- [8] **S. Fani**, K. Di Blasio, M. Bianchi, M. G. Catalano, G. Grioli, A. Bicchi (2019).  
Relaying the High Frequency Contents of Tactile Feedback to Robotic Prosthesis Users: Design, Filtering, Implementation and Validation.  
In *IEEE Robotics and Automation Letters*, 4(2), 926-933.  
doi: 10.1109/LRA.2019.2894380
- [9] A. Giannini, M. Bianchi, D. Doria, **S. Fani**, M. Caretto, A. Bicchi, T. Simoncini (2019).  
Wearable haptic interfaces for applications in gynecologic robotic surgery: a proof of concept in robotic myomectomy.  
In *Journal of robotic surgery*, 1-4.  
doi: 10.1007/s11701-019-00971-w
- [10] E. Pezent, **S. Fani**, J. Clark, M. Bianchi, M. K. O'Malley (2019).  
Spatially Separating Haptic Guidance from Task Dynamics through Wearable Devices.  
In *IEEE Transactions on Haptics*, Early Access.  
doi: 10.1109/TOH.2019.2919281