

LUCIA BECCAI

Curriculum Vitae et Studiorum

PARTE I: INFORMAZIONI GENERALI

Posizioni

2015 - oggi

- **Tenure Track Senior Researcher** presso il Centro di Micro-BioRobotica (mbr.iit.it) dell' Istituto Italiano di Tecnologia (IIT) (www.iit.it). **Principal Investigator** della linea di ricerca "*Artificial Touch in Soft Biorobotics*".

2009 - 2014

- **Team Leader Researcher** presso il Centro di Micro-BioRobotica (mbr.iit.it) dell' Istituto Italiano di Tecnologia (IIT) (www.iit.it).

2008 - 2009

- **Ricercatore t.d.** di Ingegneria Biomedica, settore scientifico disciplinare ING-IND/34 Bioingegneria Industriale, Istituto di Biorobotica, Scuola Superiore Sant'Anna, Pisa.

2003 - 2008

- **Assistente alla ricerca post-doc** titolare di n. 6 assegni di ricerca nell'ambito del settore scientifico disciplinare ING-IND/34 Bioingegneria Industriale presso la Scuola Superiore Sant'Anna (SSSA) di Pisa. Titoli dei programmi di ricerca: "Studio di problematiche di interfaccia tra materiali biologici e strumentazione di monitoraggio" e "Analisi sperimentale, sviluppo e caratterizzazione dei piattaforme meccatroniche e sistemi sensoriali per lo studio e l'emulazione del senso umano del tatto" (vedasi la sezione titoli accademici e professionali).

Istruzione e percorsi formativi

Marzo 2003

- **Dottorato di Ricerca in Ingegneria dei Microsistemi**, XV° ciclo, Università Degli Studi di Roma Tor Vergata. Titolo: "Design, fabrication and packaging of a silicon based three-axial force sensor for biomedical applications" Coordinatore: Prof. A. Tucciarone; Relatore: Prof. P. Dario.

Maggio-Ottobre 1998

- **Corso di formazione professionale "Microelettronica nelle Telecomunicazioni"** (350 ore) tenuto presso il Consorzio Pisa Ricerche, Pisa.
- **Stage** (150 ore) presso C-MAP S.r.l., Marina di Carrara (MS). Titolo del progetto: "Design of GPS navigation system for flying vectors".

Maggio 1998

- **Abilitazione** all'esercizio della professione di ingegnere elettronico.

Febbraio 1998

- **Laurea in Ingegneria Elettronica vecchio ordinamento**, indirizzo Microelettronica, Università degli Studi di Pisa, votazione finale di 105/110. Titolo della tesi: "Realizzazione di membrane di ossido di zirconio per lo sviluppo di microsensori integrabili di ossigeno". Relatori: Prof. A. Nannini, Prof. A. Diligenti.

Attività scientifiche di servizio

Nazionali

- **Consulente** di due diligence tecnologica nel settore di ingegneria biomedical: TechnoDeal S.r.l. (2000-2002); MicroTECH S.r.l. (2006-2008).
- **Membro** del comitato locale di organizzazione della 6a Conferenza Nazionale di Sensori e Microsistemi - AISEM2001 tenutasi presso la Scuola Superiore Sant'Anna (SSSA), 5-7 Febbraio, 2001.
- **Insegnamento accademico presso** Scuola Superiore Sant'Anna (SSSA) e Università di Pisa:
 - Dottorato in MicroBioRobotics, SSSA - corso "Fundamentals for Microbiorobotics" (2012-2013).
 - Dottorato in BioRobotica, SSSA - modulo didattico "Artificial tactile sensing in biorobotics" (2008-2009).
 - Ingegneria, settore Biorobotica, SSSA - modulo didattico "Physical sensors for humanoid robotics" (2008-2009).
 - Ing. Biomedica, Univ. of Pisa - modulo didattico al corso di Robotica Medica (2005-2007).
 - Ing. Biomedica, Univ. of Pisa - modulo didattico al corso di Biomeccatronica (2002-2004).
 - Ing. Biomedica, Univ. of Pisa - modulo didattico al corso di Meccatronica (1999-2003).
- **Membro** di Commissioni di esame di dottorato presso SSSA (2008-presente).
- **Membro** di Commissioni di valutazione ricercatori e assistenti alla ricerca presso SSSA (2006-2009).
- **Membro** del Comitato Bilaterale tra IIT e SSSA.

Internazionali

- **Special issue co-editor** per Bioinspiration&Biomimetics "'From Plants and Animals to robots: Movements sensing and control."
- **Associate Editor** per Scientific Reports.
- **Associate Editor** per Frontiers in Robotics and AI, sezione Soft Robotics.
- **Associate Editor** per Applied Bionics and Biomechanics.
- **Associate Editor** della 2014 IEEE Int. Conf. on Robotics and Automation Conference, ICRA 2014, 31 maggio- 5 giugno, 2014, Hong Kong, China.
- **Review Editor** per Frontiers in Bionics, Frontiers in Bioengineering and Biotechnology (dal 2013).
- **Membro dello steering committee** della 3rd Int. Conference on NanoGenerators and PiezoTronics (NGPT, Rome), 15-17 giugno, 2016.
- **Member of the SSSA Organizing Committee** della WASEDA-SSSA-KIST-Tsukuba-Nagoya Summer School in Autumn, WSK-TNg2009, "From Communication to Collaboration", Waseda University, 2-7 novembre, 2009, Tokyo, Giappone.
- **Co-chair** della Special Session "Touch Sensing for Neurocontrolled Prosthetic Hands" 10th Int. Conf. on Rehabilitation Robotics ICORR2007, June 13-15, 2007, Noordwijk, The Netherlands.
- **Co-organizer** del Workshop "From Plants and Animals to robots: Movements sensing and control. Two worlds in comparison." IROS 2015, 28 settembre, 2015, Amburgo, Germania.
- **Co-organizer** del Workshop "Learning from the Plant Kingdom to Invent Smart Artificial Solutions", 2nd Int. Conf. on Biohybrid and Biomimetic Systems, Living Machines 2013, July 29, 2013, Imperial College of London, Londra.
- **Co-organizer** del Workshop "The CYBERHAND meets the users" Institut Guttmann, November 20, 2004, Badalona, Spagna.
- **Membro del Programme Committee** della 4th Int. Conf. on Biomimetic and Biohybrid Systems, Living Machines 2015, Jul. 28-Lug.31, 2014, Barcelona, Spagna.

- **Membro del Programme Committee** della 3rd Int. Conf. on Biomimetic and Biohybrid Systems, Living Machines 2014, Jul. 30-Aug.1, 2014, Milano.
- **Membro del Programme Committee** 2nd Int. Conf. on Biomimetic and Biohybrid Systems, Living Machines 2013, Jul. 29-Aug.2, 2013, Londra.
- **Membro del Programme Committee** della 12th European Conference on Artificial Life, ECAL 2013, September 2-6 2013, Taormina.
- **Membro del Industrial Research Committee** durante il "Touch Workshop: Creating Tactile Materials" presso la UNILEVER R&D, 11-12 luglio, 2006, Port Sunlight, UK.
- **Membro del Local Organizing Committee** 2006 1st IEEE/RAS EMBS Int. Conf. on Biomedical Robotics and Biomechatronics, 20-22 febbraio, 2006, Pisa.
- **Revisore esterno** Tesi PhD in Ingegneria Elettronica "Sistema Implantable para la Estimulaciòn y Registro de Nervio Periférico" J. Sacristàn, 2007, Universidad Autonoma de Barcelona, Barcelona, Spagna. Direttore Tesi: Prof. Xavier Navarro Acebes.
- **Revisore esterno** Tesi PhD in Biologia: "Evaluación neurobiológica de electrodos regenerativos como interfase entre nervios lesionados y prótesis biónicas" N. Llago, 2006 Universidad Autonoma de Barcelona, Barcelona, Spagna. Direttore Tesi: Dr. M. Teresa Osés Ollo, Dr. Francesc Serra Graells 2006.

Società professionali

- Membro IEEE (www.ieee.org) (2006-presente)
- Membro della IEEE Robotics & Automation Society (<http://www.ncsu.edu/IEEE-RAS/>) (2006-presente)
- Membro della IEEE Engineering in Medicine and Biology Society (www.embs.org) (2006-presente)
- Membro della Materials Research Society – MRS (<http://www.mrs.org>) (2011-presente)

Revisore scientifico

Riviste internazionali:

- Science Robotics, Scientific Reports, Soft Robotics, Advanced Materials, Advanced Energy Materials, Advanced Functional Materials, Advanced Electronic Materials, Applied Materials & Interfaces, IEEE/ASME Transactions on Mechatronics, IEEE Transactions on Robotics, IEEE Robotics & Automation Magazine, IEEE Robotics and Automation Letters, IEEE Sensor Journal, Sensors and Actuators A: Physical, Sensors, Actuators, Smart Materials and Structures, IEEE Transactions on Industrial Electronics, Frontiers, Bioinspiration&Biomimetics, PLOS ONE, Advanced Materials, IEEE Transactions on Neural Systems and Rehabilitation Engineering, Journal of Micromechatronics, Measurement Science and Technology, Journal of Robotics and Autonomous Systems, Journal of Micromechanics and Microengineering

Conferenze internazionali:

- BIOROB, ICRA, IROS, ICORR, Living Machines, RoboSoft

Premi e riconoscimenti

Aprile 2005

- WELL-TECH Award 2005 for the research in CYBERHAND "Development of a CYBERnetic HAND prosthesis", National Science and Technology Museum *Leonardo da Vinci*, Milan, Italy, April 15, 2005.

Novembre 2000

- Awarded the first place for User Project "Fabrication of a human skin-like tactile microsensor for prosthetic, neuroprosthetic, and robotic applications," within the EU project EMERGE (EU/HPRI-CT-1999-00023) "Enhancing Microtechnological Education of young Researchers through Guest Experiments" led by Institut fuer Mikrotechnik Mainz, IMM, Mainz, Germany.

C. Brevetti e Trasferimento Tecnologico

Brevetti

1. A. Levi, L. Beccai, M. Piovanelli, S. Furlan, B. Mazzolai, "Touch-Sensitive Device And Detection Method"
 - o Domanda brevetto italiano IT MI2012A000813 (May 11, 2012). 100% IIT.
 - o Estensione internazionale PCT/IB2013/053786 (May 10, 2013), published as WO 2013/168127 (Nov. 14, 2013). 100% IIT.
2. V. Mattoli, F. Greco, L. Beccai, P. Dario, "Sensing Moisture Level Of Human Skin"
 - o Domanda brevetto italiano IT FI2010A000053 (Mar. 29, 2010), rilasciata come brevetto di invenzione industriale N. 001399338 (Apr. 16, 2013). 50% IIT, 50% SSSA.
 - o Estensione internazionale PCT/IB2011/051299 (March 28, 2011), pubblicata come WO 2011/121518 (6 ottobre, 2011) 100% IIT.
 - o Nazionalizzazione EP 11716067.1 (Sept. 29, 2012), pubblicata come EP 2552311 (Feb. 6, 2013) 100% IIT.
 - o Nazionalizzazione US 13/637347 (Sept. 29, 2012), pubblicata come s US 2013/0066170 (Mar. 14, 2013) released as US 8652042 (Feb. 18, 2014) 100% IIT.
3. M. Taghavi, V. Mattoli, L. Beccai, B. Mazzolai "Composito triboelettrico per raccolta di energia meccanica e rilevazione"
 - o Domanda brevetto italiano TO2014A000218 (18 marzo, 2014) 100% IIT;
 - o PCT application PCT/IB2015/051945 100% IIT.
4. C. M. Oddo, R. A. Romeo, L. Zollo, L. Beccai, E. Guglielmelli, M. C. Carrozza "Metodo Di Posizionamento Di Recettori Per Stimoli Sensoriali, Dispositivo Ottenuto Tramite Detto Metodo E Apparecchiature Comprendenti Detto Dispositivo" Brevetto italiano 102016000076248 (PT160316) July 20, 2016; 10% IIT.

Azienda start-up

Il brevetto intitolato "Touch sensitive device and detection method" ha portato alla creazione di una start-up che sviluppa interface tattili. La start-up ha vinto:

- Il terzo posto alla STARTCup Toscana 2012 (3 ottobre, 2012, Firenze)
- Il premio Intel Capital award "Premio Nazionale Innovazione" PNI 2012 (29-30 novembre, 2012, Bari)

La start-up si chiama *Sensing ElectroMagnetic Plus (SEM+)* ed è stata fondata da tre degli inventori: A. Levi, M. Piovanelli e S. Furlan, che erano studenti di dottorato presso IIT e supervisionati da Lucia Beccai. SEM+ è stata incorporata il 9 aprile, 2013 a Palo Alto, California. Il 24 giugno, 2013, SEM+ ha vinto il Europe Intel Business Challenge.

Il brevetto "Touch sensitive device and detection method" è stato venduto da IIT a SEM+ nel novembre 2015.

Altre attività

2006-2008

- Collabora con la MicroTECH s.r.l. per l'ingegnerizzazione del dispositivo MicroTAF (MICRO TriAxial Force sensor) e per esplorarne le effettive possibilità di industrializzazione.
- Ottiene un accordo tra le parti coinvolte quali la Scuola Superiore Sant'Anna, l'Institut fuer Mikrotechnik Mainz e MicroTECH s.r.l., mirato alla regolamentazione della collaborazione per lo sfruttamento commerciale e in ambito di nuovi progetti di ricerca del dispositivo.

D. Seminari a invito

Nazionali

- "Bioispirazione, nuovi materiali e tecnologie verso l'evoluzione robotica" Maker Faire, Roma, Oct. 14, 2016
- "La natura ci ispira: la pianta robotica mette le radici" - TECO meeting (tecomeeting.it) Meccatronica, Automazione e trasmissione di potenza. Il Sole 24 Ore, Milan, June 16, 2015.
- "Nuove tecnologie 'soft' per touch sensing e energy harvesting verso applicazioni wearable" Cabiotech 4.0 Wake up future 8-9 Ottobre, 2014, MUMAC, Milano, Italy.
- "New approaches to soft smart tactile sensing" IIT - SSSA - Waseda Joint Symposium on Smart Materials for Biomedical Applications, Pontedera, Italy, March 19, 2012.
- "La Biorobotica: nuovi robot e macchine intelligenti ispirati alla Natura", Settimana della Cultura Scientifica, Biblioteca delle Oblate, Florence, Italy, October 21, 2011.
- "La Biorobotica" within the Tuscany Region program "Pianeta Galileo 2008", Liceo Cecioni, Livorno, Italy, November 11, 2008.
- "Cyberhand: Potenzialità e visione futura", Centro Protesi Vigorso di Budrio Inail, Budrio, Italy, November 25, 2005.

Internazionali

- L. Beccai "Detecting mechanical cues via soft material sensing: low cost technological solutions and bioinspired approaches" International Union of Materials Research Societies – International Conference on Electronic Materials 2018 (IUMRS-ICEM 2018), August 20, 2018, Daejeon South Korea
- L. Beccai "Mechanosensing for soft robotics: technological approaches and open issues" within workshop "Towards Soft Perceptive Robots: From Robotic and Biologically-Inspired Solutions, To Soft Sensing Technologies" Robosoft 2018, April 24, Livorno, Italy
- L. Beccai "Enabling multimodal mechanosensing with soft materials: technological solutions and bioinspired approaches" Case Western Reserve University, Biologically Inspired Laboratory, Nov. 27, 2017
- L. Beccai, M. Taghavi, M. Totaro "Triboelectric composite generators and impact sensors via soft material 3D moulding" MRS Spring Meeting & Exhibit, ES4: Nanogenerators and Piezotronics, Phoenix, Apr. 21, 2017.
- L. Beccai "Mechanical sensing in soft robotics and wearable systems: challenges and technological approaches", Pohang University of Science and Technology, POSTECH, Pohang, South Korea, Nov. 10, 2016.
- L. Beccai "Simple methods for highly sensitive multimodal tactile systems in soft robotics" at International Conference for Electronic Materials and Green Environment, ENGE 2016, Jeju, South Korea, Nov. 8, 2016.

- L. Beccai "Soft mechanosensing for soft robotics and wearable systems" at the 3D Lab Exchange Symposium "Interaction of Nano-Biotechnology, Chemical and Medical Biology and Robotics", Domus Comeliana, Pisa (Italy), Sept. 21, 2016.
- L. Beccai, M. Taghavi, V. Mattoli "Energy harvesting and sensing based on soft triboelectric composites and flexible surfaces" at the 3rd Int. Conference on NanoGenerators and PiezoTronics, NGPT, Consiglio Nazionale delle Ricerche, Roma (Italy), June 15-17, 2016.
- L. Beccai "Soft Robotic Artificial Touch" at the Robosoft Plenary Meeting, Livorno, April 27, 2016.
- C. Lucarotti, M. Totaro, A. Mondini C. Cipriani, L. Beccai "An electrotiles-based sensorized glove for wearable robotics and rehabilitation" at the 2016 MRS Spring Meeting & Exhibit Phoenix (Arizona), Symposium on Electronic Textiles, March 31, 2016.
- L. Beccai "Soft artificial touch strategies and technologies inspired by plants" Workshop at IROS 2015 on: "From Plants and Animals to robots: Movements sensing and control. Two worlds in comparison", IROS 2015, Hamburg Germany, September 28, 2015.
- L. Beccai ... "Soft Triboelectric Composite Generators and Sensors." 4th International Symposium on Energy Challenges and Mechanics (ECM4) - Working on Small Scales, Aberdeen, Scotland UK, 11-13 August 2015.
- L. Beccai "Soft sensing inspired by plants" PLEASSED satellite workshop on Bio-inspired ICT, ECCS'14, Institute for Advanced Studies, Lucca, Italy, September 24, 2014.
- L. Beccai, V. Mattoli "Plant inspired technologies for sensing and actuation" Workshop on Smart Solutions From The Plant Kingdom: Beyond The Animal Models Second Edition, Accademia dei Georgofili, Firenze, Italy June 9, 2014.
- L. Beccai "Innovative soft robotic approaches to tactile sensing," École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland, March 24, 2014,.
- L. Beccai "Soft and smart sensing approaches for providing tactile cues in biorobotics," Invited talk at TT Symposium on "Materials and Processes for Electronic Skins", MRS Spring Meeting, S. Francisco, USA, April 1-5, 2013.
- L. Beccai, Roughness Discrimination of Surfaces in Artificial Active Touch, Royal Society Theo Murphy Meeting on "Active tactile sensing" Chicheley, UK, Feb. 2, 2011.
- L. Beccai Soft, bio-hybrid actuation and sensing for robot companions – a roadmap Workshop on Materials Challenges for Robot Companions, held at the Kroto Research Institute of the University of Sheffield, on July 8, 2011.
- L. Beccai, Biomimetic muscles MATTER WG meeting, Universitat Pompeu Fabra, Barcelona, September 5, 2011.
- L. Beccai, Smart soft tactile systems MATTER WG meeting, Universitat Pompeu Fabra, Barcelona, September 5, 2011.
- L. Beccai "New microrobotic sensing systems coming from nature" CERN European Organization for Nuclear Research, Geneva, Switzerland, December 7, 2010.
- L. Beccai "Tactile sensing technologies for new products and materials" UNILEVER R&D, Port Sunlight, UK, November 11, 2008.
- L. Beccai "On the development of bio-inspired tactile sensory systems for anthropomorphic prosthetic hands". Invited talk at the "Touch Workshop: Creating Tactile Materials", UNILEVER R&D, Port Sunlight, UK, July 11, 2006.
- L. Beccai "The challenges of bioinspired artificial touch", Sensory Motor Neuroscience Lab, University of Birmingham, Birmingham, UK, May 26, 2006
- L. Beccai "Prosthetic applications for MEMS based tactile sensing" Institut fuer Mikrotechnik Mainz, IMM, Mainz, Germany, May 23, 2005.

- L. Beccai “New sensing approaches based on MEMS-polymer hybrid integration”, Institut fuer Mikrotechnik Mainz, IMM, Mainz, Germany, November 6, 2001.
- L. Beccai P. Dario “Microsystem technologies for organ tissue interfacing”, Centro Nacional de Microelectrónica, Universidad Autonoma de Barcelona, Bellaterra (Barcelona, Spain), December 10, 1999.

PARTE II: PUBBLICAZIONI SCIENTIFICHE

Articoli su riviste internazionali ISI

1. H. Wang, D. Jones, G. de Boer, J. Kow, **L. Beccai**, A. Alazmani P. Culmer (2018) “Design and Characterization of Tri-axis Soft Inductive Tactile Sensors”, IEEE Sensors Journal, *in press*
2. H. Wang, M. Totaro, **L. Beccai** (2018) “Towards Perceptive Soft Robots: Progress and Challenges” Advanced Science, 5 1800541
3. S. Taccola, A. Bellacicca, P. Milani, **L. Beccai**, F. Greco (2018) “Low-voltage dielectric elastomer actuators with stretchable electrodes fabricated by supersonic cluster beam implantation” Journal of Applied Research, 124, pp. 064901
4. M. Totaro, A. Mondini, A. Bellacicca, P. Milani, **L. Beccai** (2017) “Integrated Simultaneous Detection of Bending and Tactile cues for Soft Robotics” Soft Robotics 4(4): 400-410.
5. M. Totaro, T. Poliero, A. Mondini, C. Lucarotti, G. Cairolì, J. Ortiz, **L. Beccai** (2017) “Soft smart garments for lower limb joint position analysis” Sensors 17(10): 2314, 2017.
6. A. Sadeghi, A. Mondini, E. Del Dottore, V. Mattoli, **L. Beccai**, S. Taccola, C. Lucarotti, B. Mazzolai (2017) “A plant-inspired robot with soft differential bending capabilities” Bioinspiration and Biomimetics 12(1), 015001
7. C. Larson, B. Peele, S. Li, S. Robinson, M. Totaro, **L. Beccai**, B. Mazzolai, R. Shepherd (2016) “Highly Stretchable Electroluminescent Skin for Optical Signaling and Tactile Sensing” Science, pp. 1071- 1074. DOI: 10.1126/science.aac5082
8. B. Mazzolai, V. Mattoli, **L. Beccai** (2017) “Soft-plant robotic solutions: biological inspiration and technological challenges” in Advances in Unconventional Computing Volume 2: Prototypes, Models and Algorithms. Adamatzky, A. (Ed.), Springer. DOI 10.1007/978-3-319-33921-4_27
9. I. Bernardeschi, O. Tricinci, V. Mattoli, C. Filippeschi, B. Mazzolai, **L. Beccai** (2016) “Three-Dimensional Soft Material Micropatterning via Direct Laser Lithography of Flexible Molds” Applied Materials & Interfaces, pp. 25019–25023 DOI: 10.1021/acsami.6b08872
10. M. Taghavi, A. Stinchcombe, J. Greenman, V. Mattoli, **L. Beccai**, B. Mazzolai, C. Melhuish, I. Ieropoulos (2015) “Self-sufficient wireless transmitter powered by foot-pumped urine operating wearable MFC” Bioinspiration&Biomimetics -100592 (IF: 2.354)
11. I. Bernardeschi, F. Greco, G. Ciofani, A. Marino, V. Mattoli, B. Mazzolai and **L. Beccai** (2015) “A soft, stretchable and conductive biointerface for mechanotransduction studies” Biomedical Microdevices, vol. 17, (no. 2), pp. 46, 1572-8781 (IF: 2.877)
12. C. Lucarotti, M. Totaro, A. Sadeghi, B. Mazzolai and **L. Beccai** “Revealing bending and force in a soft body through a plant root inspired approach” (2015) Scientific Reports, vol. 5, pp. 8788, 2045-2322 (IF: 5.578)
13. M. Taghavi, A. Sadeghi, A. Mondini, B. Mazzolai, **L. Beccai** and V. Mattoli “Triboelectric Smart Machine Elements and Self-Powered Encoder” (2015) Nano Energy, vol. 13, pp. 92-102 (IF: 10.325)
14. M. Taghavi, **L. Beccai** A contact-key triboelectric nanogenerator: Theoretical and experimental study on motion speed influence Nano Energy Vol. 18, (2015), pp. 283–292. (IF 10.325)

15. M. Taghavi, V. Mattoli, A. Sadeghi B. Mazzolai, **L. Beccai** "A novel soft metal-polymer composite for multi-directional pressure energy harvesting" *Advanced Energy Materials* 4(12), 2014, 1400024 (IF: 10.043)
16. M. Taghavi, A. Sadeghi, B. Mazzolai, **L. Beccai**, V. Mattoli "Triboelectric-Based Harvesting of Gas Flow Energy and Detection of Dust Concentration," *Applied Surface Science* 323 (214) pp. 82-87
17. L. Viry, A. Levi, M. Totaro, A. Mondini, V. Mattoli, B. Mazzolai, **L. Beccai** "Flexible Three-Axial Force Sensor for Soft and Highly Sensitive Artificial Touch," *Advanced Materials* 26(17):2610 (2014) (IF: 14.829) (obtained inside front cover of the issue)
18. G. Lucarini, S. Palagi, A. Levi, B. Mazzolai, P. Dario, A. Mencias, **L. Beccai**, "Navigation of magnetic microrobots with different user interaction levels" *IEEE Transactions on Automation Science and Engineering* 11(3):818-826 (2014) (IF: 1.674)
19. S. Palagi, E. Jager, B. Mazzolai, **L. Beccai** "Propulsion of swimming microrobots inspired by metachronal waves in ciliates: from biology to material specifications," *Bioinspiration & Biomimetics* 8:046004 (2013). (IF: 2.412)
20. G-L. Puleo, F. Zulli, M. Piovanelli, M. Giordano, B. Mazzolai, **L. Beccai**, L. Andreozzi "Mechanical and rheological behaviour of pNIPAAm crosslinked macrohydrogel," *Reactive&Functional Polymers* 73:1306–1318 (2013). (IF: 2.505)
21. A. Levi, M. Piovanelli, S. Furlan, B. Mazzolai, **L. Beccai** "Soft, transparent, electronic skin for distributed and multiple pressure sensing," *Sensors* 13(5):6578-6604 (2013). (IF: 1.953)
22. F. Tramacere, **L. Beccai**, M. Kuba, B. Mazzolai "Octopus Suckers Identification Code (OSIC)," *Marine and Freshwater Behaviour and Physiology* 46(6), 2013, pp. 447-453. (IF: 0.879)
23. F. Tramacere, **L. Beccai**, M. Kuba, B. Mazzolai "The Morphology and Adhesion Mechanism of *Octopus vulgaris* suckers," *PLOS ONE* 8(6):e65074 (2013). (IF: 3.73)
24. E. Sinibaldi, G. L. Puleo, F. Mattioli, V. Mattoli, F. Di Michele, **L. Beccai**, F. Tramacere, S. Mancuso, B. Mazzolai "Osmotic Actuation Modelling for Innovative Biorobotic Solutions Inspired by the Plant Kingdom," *Bioinspiration & Biomimetics* 8(2):025002 (2013). (IF: 2.412)
25. M. Taghavi, V. Mattoli, B. Mazzolai, C. Filippeschi, **L. Beccai** "Synthesizing Tubular and Trapezoidal Shape of ZnO Nanowires by Aqueous Solution Method," *Nanoscale* 5: 3505-3513 (2013). (IF: 6.233)
26. S. Palagi, C. Innocenti, C. Sangregorio, B. Mazzolai, **L. Beccai** "How does buoyancy of hydrogel microrobots affect their magnetic propulsion in liquids?" *Applied Physics Letters* 102(12):124102-5 (2013). (IF: 3.794)
27. S. Furlan, D. Comparini, M. Ciszak, **L. Beccai**, S. Mancuso, B. Mazzolai, "Origin of Polar Order in Dense Suspensions of Phototactic Micro-swimmers," *PLOS ONE* 7(6):e38895 (2012). (IF: 3.73)
28. C.M. Oddo, **L. Beccai**, J. Wessberg, H.B. Wasling, F. Mattioli, M.C. Carrozza, "Roughness encoding in human and biomimetic artificial touch: spatiotemporal frequency modulation and structural anisotropy of fingerprints," *Sensors* 2011, 11(6):5596-5615 (2011). (IF: 1.953)
29. S. Palagi, V. Pensabene, E. Sinibaldi, **L. Beccai**, B. Mazzolai, V. Mattoli, P. Dario, A. Mencias, "Controlled magnetic propulsion of floating polymeric 2D nano-objects," *Advanced Robotics* 25 (8): 1029-1047 (2011). (IF: 0.51)
30. C.M. Oddo, **L. Beccai**, C. Cipriani, M.C. Carrozza, "Roughness Encoding for Discrimination of Surfaces in Artificial Active Touch," *IEEE Transactions on Robotics* 27 (3):522-533 (2011). (IF: 2.571)
31. C. M. Oddo, **L. Beccai**, N. Vitiello, H.B. Wasling, J. Wessberg, M.C. Carrozza, "A Mechatronic Platform for Human Touch Studies," *Mechatronics* 21: 604–613 (2011). (IF: 1.3)
32. H. B. Muhammad, C. Recchiuto, C. M. Oddo, **L. Beccai**, C.J. Anthony, M. J. Adams, M.C. Carrozza, M.C.L. Ward, "A capacitive tactile sensor array for surface texture recognition," *Microelectronic Engineering* 88(8):1811-1813 (2011). (IF: 1.224)

33. E. Buselli, A. Smith, L. Grover, A. Levi, R. Allman, A. Menciassi, V. Mattoli, **L. Beccai**, "Development and characterization of a bio-hybrid skin-like stretchable electrode," *Microelectronic Engineering* 88(8):1676-1680 (2011). (IF: 1.224)
34. H.B. Muhammad, C.M. Oddo, **L. Beccai**, C.J. Anthony, M.J. Adams, M.C. Carrozza, D.W.L. Hukins, M.C.L. Ward "Development of a Bioinspired MEMS based Capacitive Tactile Sensor for a Robotic Finger," *Sensors and Actuators A: Physical* 165(2):221-229 (2011). (IF: 1.841)
35. C.M. Oddo, **L. Beccai**, M. Felder, F. Giovacchini and M.C. Carrozza, "Artificial Roughness Encoding with a Bio-inspired MEMS-based Tactile Sensor Array," *Sensors* 9(5):3161-3183 (2009). (IF: 1.953)
36. **L. Beccai**, S. Roccella, L. Ascari, P. Valdastrì, A. Sieber, M.C. Carrozza, P. Dario, "Development and Experimental Analysis of a Soft Compliant Tactile Microsensor for Anthropomorphic Artificial Hand," *IEEE/ASME Transactions on Mechatronics* 13(2):158-168 (2008). (IF: 3.135)
37. B.B. Edin, L. Ascari, **L. Beccai**, S. Roccella, J.-J. Cabibihan, M.C. Carrozza, "Bio-inspired sensorization of a biomechatronic robot hand for the grasp-and-lift tasks," *Brain Research Bulletin* 75(6):785-795 (2008). (IF: 2.935)
38. L. Ascari, P. Corradi, **L. Beccai**, C. Laschi, "A miniaturized and flexible optoelectronic sensing system for a tactile skin," *Journal of Micromechanics and Microengineering* 17:2288–2298 (2007). (IF: 1.79)
39. C.M. Oddo, P. Valdastrì, **L. Beccai**, S. Roccella, M.C. Carrozza, P. Dario, "Investigation on calibration methods for multi-axis, linear and redundant force sensors," *Measurement Science & Technology* 18:623–631 (2007). (IF: 1.435)
40. M.C. Carrozza, G. Cappiello, S. Micera, B.B. Edin, **L. Beccai**, C. Cipriani, "Design of a cybernetic hand for perception and action," *Biological Cybernetics* 95(6):629-644 (2006). (IF: 2.067)
41. S. Micera, M.C. Carrozza, **L. Beccai**, F. Vecchi, P. Dario, "Hybrid bionic systems for the replacement of hand function," *Proceedings of the IEEE*, 94(9):1752-1762 (2006). (IF: 6.911)
42. P. Valdastrì, K. Harada, A. Menciassi, **L. Beccai**, C. Stefanini, M. Fujie, P. Dario, "Integration of a miniaturized triaxial force sensor in a minimally invasive surgical tool," *IEEE Transactions on Biomedical Engineering* 53(11):2397-2400 (2005). (IF: 2.348)
43. P. Valdastrì, S. Roccella, **L. Beccai**, E. Cattin, A. Menciassi, M.C. Carrozza, P. Dario, "Characterization of a novel hybrid silicon three-axial force sensor," *Sensors and Actuators A* 123–124:249–257 (2005). (IF: 1.841)
44. **L. Beccai**, S. Roccella, A. Arena, F. Valvo, P. Valdastrì, A. Menciassi, M.C. Carrozza, and P. Dario, "Design and fabrication of a hybrid silicon three-axial force sensor for biomechanical applications," *Sensors and Actuators A* 120(2):370-382 (2005). (IF: 1.841)

Articoli su altre riviste

45. M. Totaro, N. M. Pugno, B. Mazzolai, **L. Beccai** (2017) "Micromechanical Analysis of Soft Tactile Sensors" *Frontiers in Materials*, 4, p.3
46. B. Mazzolai, **L. Beccai**, V. Mattoli "Plants as model in biomimetics and biorobotics: New perspectives" *Frontiers in Bioengineering and Biotechnology* 2:2. (2013) doi: 10.3389/fbioe.2014.00002
47. H.B. Muhammad, C.M. Oddo, **L. Beccai**, M.J. Adams, M.C. Carrozza, D.W. Hukins, M.C.L. Ward, "Development of a Biomimetic MEMS based Capacitive Tactile Sensor," *Procedia Chemistry* 1(1):124-127 (2009).

Articoli completi e abstract in atti di convegni internazionali con peer review

48. M. Totaro, **L. Beccai** "Electromechanical behavior of soft porous capacitive sensors" 2018 IEEE International Conference on Soft Robotics, RoboSoft 2018, pp. 233-238 *Full paper*.

49. A. Blandin, M. Totaro, I. Bernardeschi, **L. Beccai** "Tunable Normal and Shear Force Discrimination by a Plant-Inspired Tactile Sensor for Soft Robotics" 6th Int. Conf. on Biomimetic and Biohybrid Systems, Living Machines 2017, Stanford, USA, Jul. 31-Aug.2, 2017. *Paper and oral presentation. Winner for best presentation award.*
50. S. Taccola, A. Bellacicca, P. Milani, **L. Beccai**, F. Greco "Thin silicone-based dielectric elastomer actuators with soft and stretchable electrodes obtained by Supersonic Cluster Beam Deposition" International conference on Electromechanically Active Polymer (EAP) transducers & artificial muscles EuroEAP2016, Helsingør, June 14-15, 2016. *Abstract and Poster.*
51. M. Totaro, N. Pugno, B. Mazzolai, **L. Beccai** (2015) Micromechanical analysis of soft tactile sensors. 9th European Solid Mechanics Conference (ESMC 2015) July 6 - 10, 2015, Leganés-Madrid, Spain. *Abstract and oral presentation.*
52. M. Taghavi, C. Filippeschi, B. Mazzolai, **L. Beccai** (2015) Hierarchical surface patterning for triboelectric nanogenerators and sensors IEEE Nano 2015, Rome 27-30 July, 2015. *Full paper.*
53. C. Lucarotti, A. Sadeghi, M. Totaro, A. Mondini, B. Mazzolai, **L. Beccai** Soft Tactile Sensing for Bioinspired Robotic Roots in Proc. ICRA 2015 - Workshop "Get in Touch! Tactile & force sensing for autonomous, compliant, intelligent robots", Seattle WA, 2015. *Abstract and Poster.*
54. A. Argiolas, R. Kojcev, C. Lucarotti, E. Sinibaldi, B. Mazzolai, C. Laschi, **L. Beccai** A multilayer soft artificial skin for embodied tactile feedback in Proc. ICRA 2015 - Workshop "Soft Robotics", Seattle WA, 2015. *Abstract and Poster.*
55. M. Taghavi, A. Sadeghi, A. Mondini, B. Mazzolai, F. Greco, **L. Beccai**, V. Mattoli Machine elements for recovering energy wasted by friction. MRS Spring Meeting&Exhibit, April 6-10, 2015, S. Francisco, CA. *Abstract and Poster.*
56. C. Lucarotti, M. Totaro, L. Viry, **L. Beccai**, B. Mazzolai, "Soil Mechanical Impedance Discrimination by a Soft Tactile Sensor for a Bioinspired Robotic Root" 3rd Int. Conf. on Biomimetic and Biohybrid Systems, Living Machines 2014, Milano, Italy, Jul. 31-Aug.2, 2014. *Extended Abstract and Poster..*
57. M. Taghavi, A. Sadeghi, B. Mazzolai, **L. Beccai**, V. Mattoli "Triboelectric-Based Harvesting of Gas Flow Energy and Detection of Dust Concentration," 2013 MRS Fall Meeting December 1-6, Boston USA. *Abstract and Poster.*
58. S. Palagi, F. Greco, B. Mazzolai, **L. Beccai**, "Bioinspired design and energetic feasibility of an autonomous swimming microrobot," in Proc. of the 2nd Int. Conf. on Biomimetic and Biohybrid Systems, Living Machines 2013, London, UK, Jul. 29-Aug.2, 2013. *Extended Abstract and Poster.*
59. I. Bernardeschi, F. Greco, G. Ciofani, V. Mattoli, B. Mazzolai and **L. Beccai**, "Soft, stretchable and conductive biointerfaces for bio-hybrid tactile sensing investigation," in Proc. of the 2nd Int. Conf. on Biomimetic and Biohybrid Systems, Living Machines 2013, London, UK, Jul. 29-Aug.2, 2013. *Extended Abstract and Poster.*
60. M. Follador, F. Tramacere, L. Viry, M. Cianchetti, **L. Beccai**, C. Laschi, B. Mazzolai "Octopus-Inspired Innovative Suction Cups," in Proc. of the 2nd Int. Conf. on Biomimetic and Biohybrid Systems, Living Machines 2013, London, UK, Jul. 29-Aug.2, 2013. *Extended Abstract and Poster. Winner of Best Demo Award.*
61. **L. Beccai**, A. Levi, L. Viry, F. Greco., V. Mattoli, B. Mazzolai, "Soft and smart sensing approaches for providing tactile cues in biorobotics," in Proc. of the 2013 MRS Spring Meeting April 1-5, S. Francisco USA. *Abstract and Invited Talk.*
62. M. Taghavi, V. Mattoli, B. Mazzolai, C. Filippeschi, **L. Beccai** "Physically Blocking ZnO Nanowires Growth in Specific Directions for Novel Nano-Structures Development," 2013 MRS Spring Meeting April 1-5, S. Francisco USA. www.prolibraries.com/mrs/?select=session&sessionID=1444. *Abstract, Poster and presentation on web. Finalist best poster award.*

63. F. Tramacere, **L. Beccai**, B. Mazzolai, "What can we learn from octopus?" in Proc. of the 1st International Conference on Biological and Biomimetic Adhesives, Lisbon, Portugal, May 09-11, 2012. *Extended Abstract and Poster*.
64. A. Sadeghi, **L. Beccai**, B. Mazzolai, "Innovative Soft Robots Based on Electro-Rheological Fluids," in Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems, IROS 2012, October 7-12, 2012 Vilamoura, Algarve, Portugal, 4237-4242. *Full paper*.
65. G. Lucarini, S. Palagi, **L. Beccai**, P. Dario, A. Menciassi, "Propulsion of magnetic microrobots in the vascular vessels of lower limbs: preliminary study," in Anthologica Medica Santoriana – Speciale Computer Assisted Radiology and Surgery, CARS 2012, June 27-30 Pisa, Italy, pp. 88-91. *Extended Abstract and Poster*.
66. S. Palagi, B. Mazzolai, **L. Beccai**, "Modeling of a Propulsion Mechanism for Swimming Microrobots Inspired by Ciliate Metachronal Waves," in Proc. of the 4th IEEE/RAS-EMBS Int. Conf. on Biomedical Robotics and Biomechatronics, BioRob 2012, June 24-27, 2012 Roma, Italy, pp. 264 – 269. *Full paper*.
67. A. Sadeghi, **L. Beccai**, B. Mazzolai, "Design and Development of Innovative Adhesion Suckers Inspired by the Tube Feet of Sea Urchins," in Proc. of the 4th IEEE/RAS-EMBS Int. Conf. on Biomedical Robotics and Biomechatronics, BioRob 2012, June 24-27, 2012 Roma, Italy, pp. 617-622. *Full paper*.
68. M. Piovaneli, T. Fujie, B. Mazzolai, **L. Beccai**, "A Bio-Inspired Approach towards the Development of Soft Amoeboid Microrobots," in Proc. of the 4th IEEE/RAS-EMBS Int. Conf. on Biomedical Robotics and Biomechatronics, BioRob 2012, June 24-27, 2012 Roma, Italy, pp. 612-616. *Full paper*.
69. F. Tramacere, **L. Beccai**, B. Mazzolai, "Design of Adhesion Device inspired by Octopus Sucker," in Proc. of the 1st Int. Conf. on Biomimetic and Biohybrid Systems, Living Machines 2012, Barcelona, Spain, July 9-12, 2012. *Extended Abstract and Poster*.
70. S. Palagi, G. Lucarini, V. Pensabene, A. Levi, B. Mazzolai, A. Menciassi, **L. Beccai**, "Wireless swimming microrobots: Design and development of a 2 DoF magnetic-based system," in Proc. of the IEEE Int. Conf. on Robotics and Automation, ICRA 2012, 14-18 May 2012, pp. 3455-3460. *Full paper*.
71. F. Tramacere, **L. Beccai**, F. Mattioli, E. Sinibaldi, B. Mazzolai, "Artificial adhesion mechanisms inspired by octopus suckers," in Proc. of the IEEE Int. Conf. on Robotics and Automation, ICRA 2012, 14-18 May 2012, pp 3846-3851. *Full paper*.
72. D. Cheneler, E. Buselli, C.M. Oddo, **L. Beccai**, M.C. Carrozza, M.J. Adams, "Bio-hybrid tactile sensor and experimental set-up for investigating and mimicking the human sense of touch," in Proc. of Workshop on "Advances in Tactile Sensing and Touch based Human-Robot Interaction" 7th ACM/IEEE Int. Conf. on Human-Robot Interaction (HRI 2012) Boston, USA, March 5-8, 2012. *Abstract and Oral Presentation*.
73. M. D'Alonzo, N. Vitiello, **L. Beccai**, H-F. Kwok, C.M. Oddo, A.M. Wing, M.C. Carrozza "Physical properties that contribute to roughness discrimination of textures with randomly distributed asperities," in Proc. of Workshop on "Advances in Tactile Sensing and Touch based Human-Robot Interaction" 7th ACM/IEEE Int. Conf. on Human-Robot Interaction (HRI 2012) Boston, USA, March 5-8, 2012. *Full paper*.
74. S. Palagi, V. Pensabene, **L. Beccai**, B. Mazzolai, A. Menciassi, P. Dario, "Design and development of a soft magnetically-propelled swimming microrobot," in Proc. of the 2011 IEEE Int. Conf. on Robotics and Automation, ICRA2011, May 9-13, 2011, Shanghai, China pp. 5109-5114. *Full Paper*.
75. S. Palagi, V. Pensabene, B. Mazzolai, **L. Beccai**, "Novel smart concepts for designing swimming soft microrobots" FET11, The European Future Technologies Conference and Exhibition 2011, 4-6 May, Budapest, Hungary. *Procedia Computer Science*, 7, 264-265. *Extended Abstract and Poster*.
76. F. Tramacere, **L. Beccai**, E. Sinibaldi, C. Laschi, B. Mazzolai, "Adhesion mechanisms inspired by octopus suckers" FET11, The European Future Technologies Conference and Exhibition 2011, 4-6 May, Budapest, Hungary. *Procedia Computer Science*, 7, 264-265. *Extended Abstract and Poster*.

77. F. Mattioli, **L. Beccai**, B. Mazzolai, "An Innovative Actuation Method based on the Osmotic Principle," in Proc. of Int. Workshop on Bio-Inspired Robots, Nantes, France, April 6-8, 2011. *Abstract and poster*.
78. F. Tramacere, **L. Beccai**, E. Sinibaldi, C. Laschi, B. Mazzolai, "Study of the morphology of *Octopus vulgaris* sucker as a model for innovative artificial adhesion mechanisms," in Proc. of Euroceph meeting, Cephalopod Biology Research in the 21st Century - A European Perspective, Vico Equense, Italy, April 7-11, 2011. *Abstract and Oral Presentation*.
79. **L. Beccai**, C.M. Oddo, M. Controzzi, C. Cipriani, M.C. Carrozza, "Roughness Discrimination of Surfaces in Artificial Active Touch," in Proc. of Royal Society Theo Murphy meeting on "Active tactile sensing" Chicheley, UK, Jan. 31, 2011- Feb. 2, 2011. *Extended Abstract, Oral Presentation and Poster*.
80. H. K. Backlund, **L. Beccai**, C. M. Oddo, M.C. Carrozza, J. Wessberg, "Human single afferent response to tactile stimuli with varying roughness: a population-level description in the time- and frequency-domains," in Proc. of Neuroscience 2010, November 13-17, 2010, San Diego, USA. *Abstract and Poster*.
81. H.B. Muhammad, **L. Beccai**, C. Oddo, M.J. Adams, M. C. Carrozza, M.C.L. Ward, "A MEMS tactile sensor array for texture recognition," in Proc. of the 36th Int. Conf. On Micro Nano Engineering 19-22 September 2010, Genova, Italy. *Full paper*.
82. E. Buselli, A. Smith, L. Grover, A. Menciassi, V. Mattoli, **L. Beccai**, "Development and characterization of a stretchable electrode on soft polymer for mammalian cell monitoring and stimulation," in Proc. of 36th Int. Conf. On Micro Nano Engineering 19-22 September 2010, Genova, Italy. *Full paper*.
83. H.B. Muhammad, N.C. Hunt, C.M. Oddo, C.T. Recchiuto, **L. Beccai**, R.M. Shelton, L. M. Grover, M.C.L. Ward, "Incorporation of novel MEMS tactile sensors into tissue engineered skin," in Proc. of the IEEE 4th Int. Conf. on Bioinformatics and Biomedical Engineering, June 18-20, 2010 Chengdu, China. *Full paper*.
84. H. F. Kwok, K. Darkins, C. M. Oddo, **L. Beccai**, A. M. Wing, "Contact force and duration effects on static and dynamic texture discrimination," in Proc. of Eurohaptics Int. Conf. on Generating and Perceiving Tangible Sensations, July 8-10, 2010, Amsterdam, PT II, 6192, pp. 9-16. *Full paper*.
85. **L. Beccai**, C.M. Oddo, C. Cipriani, M. Controzzi, F. Mattioli, M.C. Carrozza, "A bioinspired tactile fingertip for texture discrimination" in Proc. of Special Symposium/Workshop 4 "Bioinspired tactile sensing. Developing a biomimetic sensor based on nanoscale force transducers to mimic the resolution, sensitivity and dynamics of spatial touch in the human finger," Eurohaptics 2010, July 7, 2010, Amsterdam. *Full paper*.
86. C.M. Oddo, **L. Beccai**, G. Muscolo, M.C. Carrozza, "A Biomimetic MEMS-based Tactile Sensor Array with Fingerprints integrated in a Robotic Fingertip for Artificial Roughness Encoding," in Proc. of IEEE Int. Conf. on Robotics and Biomimetics, December 18-22, 2009, Guilin, Guangxi, China. *Full paper*.
87. L. Ventrelli, **L. Beccai**, V. Mattoli, A. Menciassi, P. Dario "Development of a stretchable skin-like tactile sensor based on polymeric composites," in Proc. of the IEEE Int. Conf. on Robotics and Biomimetics, December 18-22, 2009, Guilin, Guangxi, China. *Full paper*.
88. H.B. Muhammad, C.M. Oddo, **L. Beccai**, M. J. Adams, M.C. Carrozza, D.W. Hukins, M.C.L. Ward, "Development of a Biomimetic MEMS based Capacitive Tactile Sensor," in Proc. of Eurosensors XXIII, September 6-9, 2009, Lausanne, Switzerland. *Full paper*.
89. M. B. Åberg, S. Beckmann, H.B. Wasling, **L. Beccai**, C.M. Oddo, N. Vitiello, J. Wessberg, "Decoding human EEG dynamics due to tactile texture processing using independent component analysis and support vector machines," in Proc. of Neuroscience 2009, October 17-21, 2009, Chicago, IL. *Abstract and Poster*.
90. M. D'Alonzo, **L. Beccai**, A. Wing, M.C. Carrozza, "Human Tactile Studies on Discrimination Threshold for Biomimetic Force Sensitive Artificial Fingertip Development," in Proc. of Workshop on "Tactile Sensing in Humanoids – Tactile Sensors and Beyond", Humanoids 2009, December 7-10, 2009, Paris, France. *Abstract and Oral Presentation*.

91. **L. Beccai**, C.M. Oddo, C. Cipriani, M.C. Carrozza, "A biorobotic approach for artificial touch: from the development of a MEMS sensor to the tactile array integration into an actuated finger," in Proc. of Workshop on "Tactile Sensing in Humanoids – Tactile Sensors and Beyond", Humanoids 2009, December 7-10, 2009, Paris, France. *Abstract and Oral Presentation*.
92. M.C. Carrozza, C. Laschi, S. Micera, P. Dario, S. Roccella, J. Carpaneto, **L. Beccai**, A. Pisetta, L. Odetti, F. Vecchi, S. Mazzoleni, "Research on Rehabilitation Engineering at ARTS Lab, Scuola Superiore Sant'Anna, Pisa, Italy," in Proc. of 10th int. Conf. on Rehabilitation Robotics, 2007, Noordwijk, The Netherlands.
93. **L. Beccai**, S. Roccella, L. Ascari, M.C. Carrozza, P. Dario, "Experimental analysis of a soft compliant tactile microsensor to be integrated in an anthropomorphic artificial hand," in Proc. of the 8th Biennial ASME Conf. on Engineering Systems Design and Analysis, July 4-7, 2006, Turin, Italy. *Full paper*.
94. S. Bossi, S. Micera, A. Menciassi, **L. Beccai**, K.P. Hoffman, K.P. Koch, P. Dario, "On the actuation of Thin film Longitudinal Intrafascicular Electrodes," in Proc. of the 2006 1st IEEE/RAS EMBS Int. Conf. on Biomedical Robotics and Biomechatronics, February 20-22, 2006, Pisa, Italy, pp. 383-388. *Full paper*.
95. C. Cipriani, F. Zaccone, G. Stellan, **L. Beccai**, G. Cappiello, M.C. Carrozza, P. Dario, "Closed-loop controller for a bio-inspired multi-fingered underactuated prosthesis," in Proc. of the 2006 IEEE Int. Conf. on Robotics and Automation, Orlando, Florida, May 2006, pp. 2111-2116. *Full paper*.
96. B.B. Edin, **L. Beccai**, L. Ascari, S. Roccella, J. Cabibihan, M.C. Carrozza, "A bio-inspired approach for the design and characterization of a tactile sensory system for a cybernetic prosthetic hand," in Proc. of the 2006 IEEE Int. Conf. on Robotics and Automation, Orlando, Florida, May 2006, pp. 1354-1358. *Full paper*.
97. M.C. Carrozza, G. Stellan, S. Roccella, G. Cappiello, F. Zaccone, C. Cipriani, **L. Beccai**, F. Vecchi, P. Dario, "Advanced cable driven sensing artificial hands for extra vehicular and exploration activities," In Proc. of the 9th ESA Workshop on Advanced Space Technologies for Robotics and Automation, ASTRA 2006, 28-30 November 2006, ESTEC, Noordwijk, The Netherlands. *Full paper*.
98. P. Dario, M.C. Carrozza, **L. Beccai**, C. Laschi, B. Mazzolai, A. Menciassi, S. Micera, "Design fabrication and application of biomimetic sensors in biorobotics," in Proc. of the 2005 IEEE Int. Conference on Information Acquisition, June 27 - July 3, 2005, Hong Kong and Macau, China. *Full paper*.
99. M.C. Carrozza, G. Cappiello, **L. Beccai**, F. Zaccone, P. Dario, "Design Methods For Innovative Hand Prostheses," in Proc. of the 26th Ann. Int. Conference of the IEEE EMBS San Francisco, CA, USA, September 1-5, 2004, pp. 4345-4348. *Full paper*.
100. P. Valdastrì, S. Roccella, **L. Beccai**, F. Valvo, A. Menciassi, M.C. Carrozza, P. Dario, "Characterization of a Hybrid Silicon Three-Axial Force Sensor," in Proc. of EUROSENSORS 2004, September 13-15, 2004. *Full paper*.
101. P. Dario, C. Laschi, A. Menciassi, E. Guglielmelli, M.C. Carrozza, L. Zollo, G. Teti, **L. Beccai**, F. Vecchi, S. Roccella, "A Human-like Robotic Manipulation System Implementing Human Models of Sensory-Motor Coordination," in Proc. of IARP 2002, 3rd Int. Workshop on Humanoid and Human Friendly Robotics, Tsukuba, Japan, December 11-12, 2002, pp.97-103. *Full paper*.
102. P. Dario, C. Laschi, A. Menciassi, E. Guglielmelli, M.C. Carrozza, S. Micera, G. Teti, F. Leoni, C. Suppo, S. Roccella, F. Sebastiani, **L. Beccai**, "An anthropomorphic robotic platform for investigative sensory-motor coordination in grasping," in Proc. of Workshop "Embodied Artificial Intelligence special issues on the design principles", Zurich, Switzerland, October 7th, 2002. *Full paper*.
103. N. Zine, A. Ivorra, J. Aguiló, R. Villa, J. Millán, J. Bausells, A. Errachid, P. Godignon, A. Benvenuto, **L. Beccai**, F. Valvo, A. Menciassi, P. Dario, "Multisensor Silicon Needle for Cardiac Applications," in Proc. of the 1st International IEEE EMBS Special Topic Conference on Microtechnology in Medicine and Biology October 12-14, 2000, Lyon, France, 216-219. *Full paper*.

104. A. Benvenuto, **L. Beccai**, F. Valvo, A. Menciassi, P. Dario, M.C. Carrozza, J. Aguiló, A. Ivorra, R. Villa, J. Millán, P. Godignon, J. Bausells, A. Errachid, "Impedance Microprobes for Myocardial Ischemia Monitoring," in Proc. of the 1st International IEEE EMBS Special Topic Conference on Microtechnology in Medicine and Biology, October 12-14, 2000, Lyon, France, 234-238. *Full paper*.
105. A. Benvenuto, **L. Beccai**, F. Valvo, A. Menciassi, P. Dario, M.C. Carrozza, J. Aguiló, A. Ivorra, "Silicon Microprobes Packaging and Characterisation for Myocardial Ischemia Monitoring," in Proc. of Micromechanics in Europe MME 2000, October 1-3, 2000, Uppsala, Sweden. *Full paper*.
106. P. Dario, M.C. Carrozza, A. Menciassi, A. Eisinger, A. Benvenuto, **L. Beccai**, "Advances in Micromechatronics," in Proc. of 3rd EUREL Workshop and Masterclass - European Advanced Robotics Systems Development, April 12-14, 2000, University of Salford, Manchester, UK. *Full paper*.

Capitoli di libro

107. **L. Beccai**, C. Lucarotti, M. Totaro, M. Taghavi "Soft Robotics Mechanosensing" in Soft Robotics: Trends, Applications and Challenges. Laschi, C., Rossiter, J., Iida, F., Cianchetti, M., Margheri, L. (Eds.) Springer, 2017. pp.11-21.
108. B. Mazzolai, V. Mattoli, **L. Beccai** "Soft Plant Robotic Solutions: Biological Inspiration and Technological Challenges" Advances in Unconventional Computing, Adamatzky A. (Ed.), Vol. 23 of the series Emergence, Complexity and Computation, Springer, 2017, pp. 687-707.
109. B. Mazzolai, V. Mattoli, **L. Beccai**, E. Sinibaldi "Emerging Technologies Inspired by Plants" Bioinspired Approaches for Human-Centric Technologies, Cingolani R. (Ed.), Springer, 2014, pp. 111-132.
110. F. Tramacere, **L. Beccai**, B. Mazzolai "What can we learn from octopus?" In Santos R., Aldred N., Gorb S., Flammang P. (eds.) Biological and Biomimetic Adhesives, The Royal Society of Chemistry, 2013, pp. 89-102. (*Cover of the Book*).
111. **L. Beccai**, S. Micera, C. Cipriani, J. Carpaneto, M.C. Carrozza "Case Study: The Cyberhand", in J. L. Pons ed. Wearable Robots: Biomechatronic Exoskeletons, Wiley, 2008, pp.242-248.
112. M.C. Carrozza, S. Roccella, **L. Beccai**, G. Cappiello "Criteri di progettazione di protesi cibernetiche per la sostituzione funzionale dell'arto superiore," in NEURO-ROBOTICA Neuroscienze e robotica per lo sviluppo di macchine intelligenti, Pàtron Editore, 2006, pp. 279-302.

Articoli in libri

113. A. Blandin, M. Totaro, I. Bernardeschi, **L. Beccai** "Tunable Normal and Shear Force Discrimination by a Plant-Inspired Tactile Sensor for Soft Robotics" in et al. (eds.) Lecture Notes in Artificial Intelligence (LNAI) Springer-Verlag Berlin Heidelberg 2017. *Short paper*.
114. I. Bernardeschi, F. Greco, G. Ciofani, V. Mattoli, B. Mazzolai, **L. Beccai** "Soft, stretchable and conductive biointerfaces for bio-hybrid tactile sensing investigation," in N.F. Lepora et al. (eds.) Lecture Notes in Artificial Intelligence (LNAI), 8064, pp. 353–355, Springer-Verlag Berlin Heidelberg 2013. *Short paper*.
115. M. Follador, F. Tramacere, L. Viry, M. Cianchetti, **L. Beccai**, C. Laschi, B. Mazzolai "Octopus-Inspired Innovative Suction Cups" in N.F. Lepora et al. (eds.) Lecture Notes in Artificial Intelligence (LNAI), 8064, pp. 368-370, Springer-Verlag Berlin Heidelberg 2013. *Short paper*.
116. F. Tramacere, **L. Beccai**, B. Mazzolai (2012) "Design of Adhesion Device Inspired by Octopus Sucker" in T. Prescott, et al. (eds.) Lecture Notes in Artificial Intelligence (LNAI) 7375, pp. 400–01, Springer-Verlag Berlin Heidelberg 2012. *Short paper*.

117. **L. Beccai**, S. Roccella, A. Arena, A. Menciasci, M.C. Carrozza, P. Dario, "Silicon-based three axial force sensor for prosthetic applications," C. Di Natale, A. D'Amico, L. Dori, G. C. Cardinali, S. Nicoletti (eds.) *Sensors and Microsystems*, 2002, pp. 250-255, World Scientific Publishing, Singapore.
118. **L. Beccai**, A. Benvenuto, F. Valvo, A. Menciasci, M.C. Carrozza, P. Dario "Packaging and Characterisation of Short-Term Semi-Implantable Silicon Microprobes for Medical Diagnostics", C. Di Natale, A. D'Amico, P. Dario (eds.) *Sensors and Microsystems*, 2002, pp.246-253, World Scientific Publishing, Singapore.

PARTE III: TITOLI ACCADEMICI E PROFESSIONALI

Assegni di ricerca

01/08/03- 31/07/07	<p>Titolare di Assegno di Ricerca nell'ambito del settore scientifico disciplinare ING-IND/34 presso la Scuola Superiore Sant'Anna di Pisa.</p> <p><i>Titolo attività di ricerca:</i> "Studio di problematiche di interfaccia tra materiali biologici e strumentazione di monitoraggio". <i>Responsabile scientifico:</i> Prof. Paolo Dario.</p>
01/08/2004- 30/04/2005	<p>Titolare di Assegno di Ricerca nell'ambito del settore scientifico disciplinare ING-IND/34 presso la Scuola Superiore Sant'Anna di Pisa.</p> <p><i>Titolo attività di ricerca:</i> "Studio di problematiche di interfaccia tra materiali biologici e strumentazione di monitoraggio". <i>Responsabile scientifico:</i> Prof. Paolo Dario.</p>
01/05/2005- 30/04/2006	<p>Titolare di Assegno di Ricerca nell'ambito del settore scientifico disciplinare ING-IND/34 presso la Scuola Superiore Sant'Anna di Pisa.</p> <p><i>Titolo attività di ricerca:</i> "Studio di problematiche di interfaccia tra materiali biologici e strumentazione di monitoraggio". <i>Responsabile scientifico:</i> Prof. Paolo Dario.</p>
01/05/2006- 31/10/2006	<p>Titolare di Assegno di Ricerca nell'ambito del settore scientifico disciplinare ING-IND/34 presso la Scuola Superiore Sant'Anna di Pisa.</p> <p><i>Titolo attività di ricerca:</i> "Studio di problematiche di interfaccia tra materiali biologici e strumentazione di monitoraggio". <i>Responsabile scientifico:</i> Prof.ssa Maria Chiara Carrozza.</p>
01/11/2006- 31/07/2007	<p>Titolare di Assegno di Ricerca nell'ambito del settore scientifico disciplinare ING-IND/34 presso la Scuola Superiore Sant'Anna di Pisa.</p> <p><i>Titolo attività di ricerca:</i> "Studio di problematiche di interfaccia tra materiali biologici e strumentazione di monitoraggio". <i>Responsabile scientifico:</i> Prof.ssa Maria Chiara Carrozza.</p>
01/10/07- 30/09/08	<p>Titolare di Assegno di Ricerca nell'ambito del settore scientifico disciplinare ING-IND/34 presso la Scuola Superiore Sant'Anna di Pisa.</p> <p><i>Titolo attività di ricerca:</i> "Analisi sperimentale, sviluppo e caratterizzazione dei piattaforme mecatroniche e sistemi sensoriali per lo studio e l'emulazione del senso umano del tatto" <i>Responsabile scientifico:</i> Prof.ssa Maria Chiara Carrozza.</p>

Contratti di collaborazione scientifica a progetti internazionali

12/06/1999- 11/12/1999	<p>Contratto per prestazioni rese in regime di collaborazione coordinata e continuativa con la Scuola Superiore Sant'Anna di Pisa e la Commissione Europea, nell'ambito del progetto MEDEA "Microscanning Endoscope with Diagnostic and Enhanced Resolution Attributes" BMH4-CT97_2399 (DG12-SSMI) e avente oggetto "Progettazione e realizzazione di microtermometro per applicazioni in ipertermia".</p>
---------------------------	--

12/12/1999- 11/06/2000	Contratto per prestazioni rese in regime di collaborazione coordinata e continuativa con la Scuola Superiore Sant'Anna di Pisa e la Commissione Europea, nell'ambito del progetto MICROCARD "Si-based Multifunctional MICROsystem Needle for MyoCARDial Ischemia Monitoring" (EU/ESPRIT 33485) e avente oggetto "Sviluppo di tecnologie di packaging per il sensore previsto nel progetto MICROCARD"
13/11/2000- 12/12/2000	Contratto per prestazioni rese in regime di collaborazione coordinata e continuativa con la Scuola Superiore Sant'Anna di Pisa e la Commissione Europea, nell'ambito del progetto MICROTRANS "MICRO-probe multi-sensor for graft viability monitoring during organ preservation and TRANSplantation" (EU/IST-99-13047) e avente oggetto "Studio di tecniche di packaging per strumentazione biomedicale".
08/01/2001- 31/01/2001	Contratto per prestazioni rese in regime di collaborazione coordinata e continuativa con la Scuola Superiore Sant'Anna di Pisa e la Commissione Europea, nell'ambito del progetto MICROTRANS "MICRO-probe multi-sensor for graft viability monitoring during organ preservation and TRANSplantation" (EU/IST-99-13047) e avente oggetto "Studio di tecniche di packaging per strumentazione biomedicale".
01/06/2001- 31/07/2001	Contratto per prestazioni rese in regime di collaborazione coordinata e continuativa con la Scuola Superiore Sant'Anna di Pisa e la Commissione Europea, nell'ambito del progetto MICROCARD "Si-based Multifunctional MICROsystem Needle for MyoCARDial Ischemia Monitoring" (EU/ESPRIT 33485) e avente oggetto "Studio di tecniche alternative di packaging per strumentazione biomedicale".
04/11/2002- 31/12/2002	Contratto per prestazioni rese in regime di collaborazione coordinata e continuativa con la Scuola Superiore Sant'Anna di Pisa e la Commissione Europea, nell'ambito del progetto MICROTRANS "MICRO-probe multi-sensor for graft viability monitoring during organ preservation and TRANSplantation" (EU/IST-99-13047) e avente oggetto "Studio di un sistema di packaging biocompatibile per un sensore di Ph impiantato".
17/01/2003- 31/03/2003	Contratto per prestazioni rese in regime di collaborazione coordinata e continuativa con la Scuola Superiore Sant'Anna di Pisa e la Commissione Europea, nell'ambito del progetto IVP "Intracorporeal Videoprobe" (EU/IST-2001-35169) e avente oggetto "Studio di metodologie di packaging per una videotelecamera per applicazioni endoscopiche".
16/04/2003- 30/06/2003	Contratto per prestazioni rese in regime di collaborazione coordinata e continuativa con la Scuola Superiore Sant'Anna di Pisa e la Commissione Europea, nell'ambito del progetto IVP "Intracorporeal Videoprobe" (EU/IST-2001-35169) e avente oggetto "Studio di metodologie di packaging per una videotelecamera per applicazioni endoscopiche".
01/07/2003- 31/07/2003	Contratto per prestazioni rese in regime di collaborazione coordinata e continuativa con la Scuola Superiore Sant'Anna di Pisa e la Commissione Europea, nell'ambito del progetto CYBERHAND "Development of a CYBERnetic HAND prosthesis" (EU/IST-2001-35094) e avente oggetto "Coordinamento del progetto".
02/12/2003- 31/12/2003	Contratto per prestazioni rese in regime di collaborazione coordinata e continuativa con la Scuola Superiore Sant'Anna di Pisa e la Commissione Europea, nell'ambito del progetto CYBERHAND (IST 2001-35094) e avente oggetto "Supporto tecnico gestionale alla preparazione del prototipo CYBERHAND".
13/07/2004- 30/07/2004	Contratto per prestazioni rese in regime di collaborazione coordinata e continuativa con la Scuola Superiore Sant'Anna di Pisa e la Commissione Europea, nell'ambito del progetto "Realizzazione di microsistemi dedicati alla caratterizzazione delle proprietà fisiche e chimiche di mini e micro campioni biotissutali" avente ad oggetto: "La caratterizzazione di sensori fisici per la misura delle contrazioni di microvasi isolati".

23/11/2004- 10/12/2004	Contratto per prestazioni rese in regime di collaborazione coordinata e continuativa con la Scuola Superiore Sant'Anna di Pisa e la Commissione Europea, nell'ambito del progetto "Valutazione sperimentale del controllo del sistema robotico umanoide mediante segnali EMG" nell'ambito della ricerca in corso fra la Scuola Superiore Sant'Anna e la Waseda University".
10/11/2005- 10/12/2005	Contratto per prestazioni rese in regime di collaborazione coordinata e continuativa con la Scuola Superiore Sant'Anna di Pisa e la Commissione Europea, nell'ambito del progetto "Integrazione del sistema di sensori nella mano del robot umanoide Robocasa" nell'ambito della ricerca in corso fra la Scuola Superiore Sant'Anna e la Waseda University".
01/08/2007- 30/09/2007	Contratto di prestazione occasionale: "Sviluppo di un sistema sensoriale tattile per protesi di mano" nell'ambito del progetto di ricerca RPP (Revolutionizing Prosthetics Program)".

Pontedera, 30 dicembre, 2018

In fede,

Lucia Beccai