

Leonardo Serra De Mattos

WORK ADDRESS

Istituto Italiano di Tecnologia
Center for Robotics and Intelligent Systems

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EDUCATION

- DOCTOR OF PHILOSOPHY IN ELECTRICAL ENGINEERING** 6/2003 – 5/2007
North Carolina State University (NCSU), Raleigh, NC, USA
Supervisor: Edward Grant
Commission: Donald Bitzer, Troy Nagle, John Muth, Randy Thresher
- MASTER OF SCIENCE IN ELECTRICAL ENGINEERING** 1/2001 – 5/2003
North Carolina State University (NCSU), Raleigh, NC, USA
Supervisor: Prof. Edward Grant
Commission: Troy Nagle, John Muth, Mark White
- BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING** 2/1994 – 12/1998
Universidade de São Paulo (USP), São Carlos, SP, Brazil
- TECHNICAL DEGREE IN ELECTRONICS** 2/1990 – 12/1992
Colégio Técnico de Campinas (COTUCA – UNICAMP), Campinas, SP, Brazil

EXPERIENCE

- PERMANENT RESEARCHER (TECHNOLOGIST), Istituto Italiano di Tecnologia (IIT), Genoa, Italy** 10/2016 – Present
- Head of the Biomedical Robotics Laboratory, Department of Advanced Robotics: 2 Senior Researchers, 1 Researcher, 6 Post-Docs, 5 PhD students, 3 Research Fellows, 3 Technicians, 2 MSc students
 - Principal Investigator and Coordinator of the €1.03 million translational project **Robotic Microsurgery**, a 4-year project (2017–2021) funded by Fondazione Istituto Italiano di Tecnologia
 - Work Package Leader of the €3.5 million project **INAL-Teleop**, a 3-year project (2017–2020) funded by INAIL
 - Principal Investigator and Coordinator of the €1.13 million research project **TEEP-SLA** (Tecnologie Espressive ed Empatiche per Persone con SLA), a 3-year project (2015–2018) funded by Fondazione Roma
 - Graduated 11 PhD students, 3 MSc students
 - Conducting, supervising and coordinating research in surgical robotics, medical imaging, assistive systems, user interfaces, and biomanipulation automation
 - Strong collaboration with surgeons (San Martino Hospital, Genoa; AIMS Academy, Milan), clinicians (Fondazione Roma, Rome), industries (El.En. Group; ValueBiotech S.R.L.), and other research groups (Politecnico di Milano, University of Verona, North Carolina State University)
- TEAM-LEADER, Istituto Italiano di Tecnologia (IIT), Genoa, Italy** 10/2011 – 10/2016
- Head of the Biomedical Robotics Laboratory, Department of Advanced Robotics
 - Grew the laboratory from 2 PhD students to 2 Senior Researchers, 4 Post-Docs, 4 PhD students
 - Principal Investigator and Coordinator of **TEEP-SLA** (see above)
 - Principal Investigator and Coordinator of the €3.6 million research project **µRALP** - Micro-Technologies and Systems for Robot-Assisted Laser Phonomicrosurgery, a 3-year project (2012–2015) funded by the European Commission under the Seventh Framework Programme (FP7). Rated “Excellent” at final assessment
 - Graduated 5 PhD students, 2 MSc students
 - Developed strong collaboration with surgeons, clinicians, industries and other research groups
- POST-DOCTORAL RESEARCHER, Istituto Italiano di Tecnologia (IIT), Genoa, Italy** 10/2007 – 10/2011
- Created a new research laboratory for biomedical robotics research: The IIT’s Biomedical Robotics Laboratory
 - Initiated research in biomanipulations and laser phonomicrosurgeries within the Advanced Robotics Dept.
 - Developed a new system for the automation of adherent cell and embryo microinjections, which is used for

research in: microinjection control methods; biomedical image processing; mixed-reality training; visual servoing; user interfaces; and teleoperation.

- Designed and developed a new robotic system for laser phonomicrosurgery, including a novel motorized laser scanner; new user interfaces and associated control systems. System continues to be used for research in user interfaces; assistive systems; surgical safety; new surgical strategies and protocols; new calibration and control methods for micro-robotic systems; image processing for disease detection; and surgical automation
- Supervised a PhD student conducting research in biomedical image processing
- Supervised a PhD student researching safety and user interfaces for laser phonomicrosurgeries
- Initiated research collaborations with: IIT's Neuroscience Department; Center for Robotics and Intelligent machines (CRIM, NCSU, USA); Animal Models Core (AMC, UNC-CH, USA); ENT Department of the San Martino's Hospital (Genoa, Italy); Femto-ST (Besançon, France); University Hospital of Besançon (France); Leibniz Universität Hannover (Germany)

RESEARCH ASSISTANT, *Center for Robotics and Intelligent Machines, NCSU* 1/2002 – 8/2007

- Designed, implemented and evaluated an automated system for the microinjection of embryonic stem cells into blastocysts. Research conducted in collaboration with the Animal Models Core Facility at UNC-Chapel Hill.
- Designed and prototyped a wireless aircraft structural monitoring system in collaboration with the Institute for Maintenance Science and Technology at NCSU and the company DRS Technical Services, Inc.
- Worked on a multidisciplinary team to research and develop new tools for minimally invasive robotic heart surgery. Funded by a \$1.5 Million NIH Grant
- Created an automatic control and calibration module for a commercial biological tissue strain device. Funded by Flexcell International
- Created the EvBot-II (an autonomous robot for evolutionary robotics research)
- Designed and developed an USB DAQ system with simultaneous sampling of audio 8 channels
- Designed and developed a navigation and tracking system for the EvBot-II based on a small-scale acoustic array
- Participated in the designed and construction of a large scale e-textiles acoustic array with the College of Textiles (NCSU) and Draper Labs. Funded by DARPA
- Designed the electrical system and PLC code for a garment compression machine. Funded by Sara Lee Intimate Apparel Division
- Designed and built an RFID-based sensor system to detect and identify thread breaks in textile machines. Funded by the National Textile Center (NTC)
- Collaborated in the designed and developed of a capacitive sensor to measure the mass of fiberglass for on-line quality control during the manufacturing process. Funded by PPG Industries Fiber Glass Products
- Constructed an actigraph for wireless sleep motion monitoring
- Created code for automatic color segmentation on digital images based on neural networks
- Developed experimental setup for the characterization of photoluminescent materials
- Created a 360° camera system based on an inexpensive web-camera

TEACHING ASSISTANT, *ECE Department, NCSU* 8/2001 – 5/2002

- TA for ECE435 – Feedback Control Systems

ELECTRICAL ENGINEER, *Aerodyn Wind Tunnel, Charlotte, NC* 2/2001 – 7/2001

- Developed a pressure data acquisition system with 288 input channels to be used on the wind tunnel
- Created the software for data acquisition, experiments control, data logging and MS Excel interface using SoftWire and Visual Basic
- Implemented a LAN and the necessary software for real time sharing of experimental data

FIELD SERVICE ENGINEER, *FANUC America Corporation, Charlotte, NC* 5/1999 – 1/2001

- Performed on-site customer assistance
- Troubleshoot and repaired CNCs, motors, drivers, industrial lasers and other precision machine components

PROJECT ENGINEER, *Psychology Department, UFSCar, São Carlos, SP, Brazil* 7/1998 – 1/1999

- Designed and implemented an automated system for experimental learning studies on mice
- Created software for automatic experiment control and data logging

ELECTRICAL ENGINEER INTERN, *FMC Brazil, Araraquara, SP, Brazil* 1/1998 – 5/1998

- Participated in the project and construction of a new automated machine to make plastic bags
- Designed electrical diagrams, connection boxes and cabinets for the new machine

- Wrote installation check-up procedures for the new machine

UNDERGRADUATE RESEARCH, Medical Image Analysis Laboratory (ALADIM) 7/1997 – 2/1999
Electrical Engineering Dept., USP, São Carlos, SP, Brazil

- Researched the quality of X-Ray images, particularly the influence of the Heel Effect

UNDERGRADUATE RESEARCH, Optics Lab., EE Dept., USP, São Carlos, SP, Brazil 8/1995 – 2/1997

- Designed and developed circuits to test wireless optical communication systems
- Researched optical sensors for electrical currents

ELECTRONICS TECHNICIAN INTERN, AsGa Microeletronica, Paulinia, SP, Brazil 2/1993 – 8/1993

- Designed and developed an equipment for coupling optical fibers to PIN-FET's
- Supported engineering team with the design and development of test circuits for product quality control

FUNDED PROJECTS

ELVIS – EDUCATIONAL LAPAROSCOPY WITH VIRTUAL INSTRUCTIVE SIMULATIONS AND ROBOTICS

- Work package partner
- €1.55 million, 18 months (2021 – 2022), Industrial Research Project
- Funded by FILSE - Bando POR FESR 2014-2020 - Asse 1 - Azione 1.2.4 - Poli di Ricerca e Innovazione

SMART INJECTIONS

- Work package leader
- €1.6 million, 3 years (2020 – 2023), Industrial Research Project

ATLAS - AUTONOMOUS INTRALUMINAL SURGERY

- Partner for training and secondments
- €3.94 million, 3 years (2019 – 2023)
- Funded by European Commission's Marie Skłodowska Curie Innovative Training Networks

ROBOTIC MICROSURGERY

- Principal Investigator and Project Coordinator
- €1.03 million, 3 years (2017 – 2020), funded by IIT

INAIL TELEOPERATION

- Work package leader and member of steering committee
- €3.5 million, 3 years (2017 – 2020), funded by INAIL

TEEP-SLA - Tecnologie Espressive ed Empatiche per Persone con SLA (*Technologies for ALS patients*)

- Principal Investigator and Project Coordinator
- €1.13 million, 3.5 years (2015 – 2019), funded by Fondazione Roma

ROBOT-ASSISTED LASER MICROSURGERY

- Research collaboration with the company ELEN SpA (2015 – 2023)
- €100K/year in equipment and technical support provided by the company

µRALP - Micro-Technologies and Systems for Robot-Assisted Laser Phonomicrosurgery

- Principal Investigator and Project Coordinator
- €3.6 million, 3 years (2012 – 2015), funded by European Commission's FP7 Framework Programme
- GA no. 288663; Small and Targeted Research Project (STREP); Assessed as "Excellent" at its final review.
- 3 countries (Italy, Germany, France); 5 institutions (2 hospitals, 3 engineering centers); 75 people involved

PATENTS AND INVENTION DISCLOSURES

1. **Mattos, L., Acemoglu, A.**, "Dispositivo per l'orientamento sferico di un elemento ottico, in particolare per dirigere un fascio di luce, quale un fascio laser," Italian Patent Application IT 10202000002155, PCT/IB2021/050897, 4 Feb 2020.
2. **Mattos, L., Cheng, Z., Davies, B., Caldwell, D.**, "Dispositivo portatile per l'inserimento di un ago in un materiale non omogeneo, particolarmente per cateterizzazione endovenosa" (English title: "Hand-held device for inserting a needle into a non-homogeneous material"), [US2020139086 \(A1\)](#), [CN110769888 \(A\)](#), [EP3630256 \(A1\)](#), [IT201700059659 \(A1\)](#), [WO2018219842 \(A1\)](#). Granted on May 7th, 2020. Application on May 31th, 2017
3. **Mattos, L., Pane, G., Caldwell, D.**, "Device for the spherical orientation of an optical element, in particular for directing a light beam, such as a laser beam", [WO2015181771A1](#), [EP3149527 \(A1\)](#), [US10738973 \(B2\)](#), [US2017198885 \(A1\)](#). Granted on Dec 3rd, 2015. Application on May 30th, 2014

4. **Mattos**, L., Olivieri, E., Caldwell, D., "Distal scanning module, in particular to control the aiming and the movement of an optical apparatus of a medical device, such as a diagnostic or surgical instrument," [EP3073890 \(A1\)](#), [EP3073890 \(B1\)](#), [ITTO20130943 \(A1\)](#), [US10045684 \(B2\)](#), [US2016287056 \(A1\)](#), [WO2015075628 \(A1\)](#),. Granted on Oct 5th, 2016. Application on Nov 20th, **2013**
5. Grant, E., **Mattos**, L.S., Thresher, R., "Methods, Systems, and Computer Readable Media for Facilitating Automation of Blastocyst Microinjection," WO Patent 2,009,079,474, June **2009**
6. Grant, E., **Mattos**, L.S., Luthy, K., Merritt, C., Craver, M., Simmons, J., Roberts, K., Scurria, N., Roth, R., Sanwald, R., Strenkowski, J., "Methods, Systems, and Computer Readable Media for Wireless Crack Detection and Monitoring," Patent numbers: US8510061B2, US20100094566, August **2008**
7. Grant, E., **Mattos**, L.S., Thresher, R., "A Controllable and Automated Micro/Nano-Injection System," NCSU Invention Disclosure No. 08-018, US Provisional Patent Application No. 421/221PROV, December **2007**
8. Buckner, G.D., Cormier, D.R., Laffitte, B.W., **Mattos**, L.S., Adcock, D.B., "Nitinol Mesh Retractor for Minimally Invasive Cardiac Surgery," NCSU Invention Disclosure No. 06-005, October **2005**

STUDIES WITH ETHICAL COMMITTEE APPROVAL

IIT_ADVR_TELE01

- "Studio su esperienze e prestazioni di utenti in contesti simulativi di teleoperazione"
- Submitted to EC of Liguria on June 2019
- Approval: 16/03/2020, N. Registro CER Liguria: 229/2019 - ID 4621

IIT_ADVR_BEBI

- "Studio ex vivo della bioimpedenza elettrica di campioni di sangue di soggetti di minore età"
- Submitted to EC of Liguria on 22 Nov 2019
- Approval: 04/03/2020, N. Registro CER Liguria: 38/2020 - ID 10013

IIT_ADVR_SPFS01

- "Smart-Probe feasibility study: studio della bioimpedenza di tessuti sani e tumorali del tratto respiratorio superiore e della prima porzione dell'inferiore"
- Submitted to EC of Liguria on 22/03/2018 (prot. 12/04/2018)
- Approval: 21/01/2019, N. Registro CER Liguria P.R. 181/2018

IIT_ADVR_TEEP03

- "Studio di dati psicofisiologici di persone con SLA raccolti durante l'uso di interfacce utente per sistemi assistivi"
- Submitted to EC of Lazio: Studio 191.17, Protocollo 0207516/2017 del 20/12/2017
- Approval: 18/04/2018, Protocol N.0065390/2018

CALM-PIVC-MLS

- Studio di usabilità preliminare dei sistemi Computer-Assisted Laser Microsurgery (CALM), Micropinza motorizzata, Peripheral IntraVenous Catherter (PIVC) e Magnetic Laser Scanner (MLS)
- Submitted to EC of Liguria on 22/05/2017 (prot. 0014267/17)
- Approval: 12/10/2017, Verbale N. III/2017 (esenzione dall'approvazione espressa alla conduzione dello studio)

IIT_ADVR_TEEP02

- "Studio sulle variazioni fisiologiche di un individuo in compiti a diversi livelli di ecologicità"
- Submitted to EC of Liguria on 14/07/2017 (prot. 31/07/2017)
- Approval: 19/09/2017, N. Registro CER Liguria P.R. 318REG2017

IIT_ADVR_TEEP01

- Studio sul riconoscimento automatico di atti espressivi e stati affettivi di un individuo nell'interazione uomo-tecnologia
- Submitted to EC of Liguria on 28/03/2017 (prot. 30/03/2017)
- Approval: 11/04/2017, N. Registro CER Liguria P.R. 235REG2016, N. Registro Emendamenti: 01-11/04/2017

HONORS

BEST CONFERENCE PAPER AWARD, "5G Telesurgery – Feasibility Experiment and First Public Demo", CRAS 2020, September 2020

BEST SESSION PAPER AWARD, "Vision guided Autonomous Robotic Electrical Bio-Impedance Scanning System for Abnormal Tissue Detection and Tracking", CRAS 2020, September 2020

ATHANASIOU ABME STUDENT AWARD, Best Article in Annals of Biomedical Engineering: "A New Venous Entry Detection Method Based on Electrical Bio-impedance Sensing", October 2019

BEST DEMO AWARD, CALM – Computer-Assisted Laser Microsurgery, CRAS 2019, March 2019
BEST DEMO RUNNER-UP, APSurg - Abdominal Positioning Surgical System, CRAS 2019, March 2019
WINNER SMART CUP LIGURIA 2018, Start-Up project “UNLOCK” (Communication Systems for Locked-In Patients), November 2018
BEST PAPER AWARD, CRAS 2018, September 2018
BEST POSTER RUNNER-UP, CRAS 2018, September 2018
BEST PHD THESIS AWARD (student: S. Moccia) by “Gruppo Nazionale di Bioingegneria & Patron,” May 2018
PRIMAGA AWARD WINNER: Best Paper in “Artificial intelligence applied to the analysis of images and videos,” GNB 2018, June 2018
BEST PAPER AWARD FINALIST, ISMR 2018, March 2018
BEST PAPER AWARD FINALIST, CRAS 2017, September 2017
BEST PAPER RUNNER-UP, Hamlyn Symposium on Medical Robotics, June 2017
BEST PHD THESIS AWARD (student: V. Penza) by “Istituto di Biorobotica,” May 2017
BEST PAPER AWARD RUNNER-UP, CRAS 2016, September 2016
BEST POSTER AWARD RUNNER-UP, CRAS 2016, September 2016
WINNER SMART CUP LIGURIA 2015 (Start-Up contest, €5,000.00 prize), November 2015
BEST MEDICAL ROBOTICS PAPER AWARD FINALIST, IEEE ICRA 2015, May 2015
BEST AUGMENTED-REALITY VIDEO AWARD, Hamlyn Symposium Workshop on AR and Surgical Vision, July 2014
BEST PAPER AWARD, ACHI 2010, February 2010
BEST LABORATORY AUTOMATION PAPER AWARD FINALIST, IEEE CASE 2009, August 2009
BEST PRESENTATION AWARD, ECE GSA Seminar, NCSU, April 2006
THE CHANCELLOR’S LIST, 2004-2005, Vol. 1, ISBN 1-56244-412-3
ETA KAPPA NU (HKN), Member since 2003

PROFESSIONAL AFFILIATIONS

IEEE, Member since 2003, Senior Member since 2018
IEEE ROBOTICS AND AUTOMATION SOCIETY (RAS), Member since 2005
IEEE ENGINEERING IN MEDICINE & BIOLOGY SOCIETY (EMBS), Member since 2010
NCEES CERTIFIED ENGINEERING INTERN (E.I.), May 2003

COMMUNITY ACTIVITIES

Conference & Workshop Organization

- Regional Program Chair, IEEE CBS 2020, Raleigh, NC, USA, September 16-18, 2020
- Program Co-Chair, IEEE ICAR 2019, Belo Horizonte, Brazil, December 2-6, 2019
- General Chair, CRAS 2019, Genoa, Italy, March 21-21, 2019
- Publication Chair, IEEE ICARM 2017, Heifei, China, August 27-31, 2017
- Organization Committee Member, CRAS 2017, Montpellier, France, Sept. 14–15, 2017
- Organization Committee Member, CRAS 2016, Pisa, Italy, Sept. 12–14, 2016
- Organization Committee Member, CRAS 2015, Brussels, Belgium, Sept. 10–12, 2015
- General Chair, CRAS 2014, Genoa, Italy, Oct. 14–16, 2014
- Chair, IEEE BioRob 2014 Workshop on Robotic Microsurgery and Image-Guided Surgical Interventions, Sao Paulo, Brazil, 2014
- Organization Committee Member, CRAS 2013, Verona, Italy, Sept. 11–13, 2013
- Chair, IEEE BioRob 2012 Workshop on Robot-Assisted Laryngeal Microsurgery, Rome, Italy, 2012

Editor

- Applied Sciences, Robotics and Automation section, 2021-2022
- Frontiers in Robotics and AI, Topic: Novel Actuators, Sensors and Control Systems for Endoscopic Robots 2021
- Journal of Intelligent & Robotic Systems – ICAR 2019 Special Issue
- IEEE ICAR 2019, Editor for Contributed Papers
- Journal of Medical Robotics Research – CRAS 2016 Special Issue
- Journal of Medical Robotics Research – CRAS 2015 Special Issue

Associate Editor

- IEEE Robotics and Automation Letters 2021
- IEEE ICAR 2021

- IEEE IROS 2021
- IEEE ICRA 2020, 2018, 2017, 2016
- IEEE BioRob 2020, 2018, 2016, 2014
- IEEE ISMR 2020
- IEEE MFI 2015, 2010

Technical Program Committee

- International Symposium on Medical Robotics (ISMR) 2019, 2018
- Hamlyn Symposium 2020, 2019, 2018, 2017
- CRAS 2020, 2019, 2018, 2017, 2016, 2015, 2014
- MIAR 2016
- ICINCO 2016, 2014
- IEEE MFI 2015, 2010, 2008
- Russian-German Conference 2013 (RGC2013)
- IADIS MCCSIS 2011
- IARIA/IEEE ACHI 2010

Faculty memberships

- Interactive Surgery (multimedia platform for sharing surgical experiences, www.interactivesurgery.it)

INVITED TALKS

1. “Robotic Systems for Ergonomically Challenging Biomedical Tasks,” SIE-IIT Robotics & Ergonomics Workshop, September 21, **2021**
2. “New Platform for Teaching,” Rectal Cancer Conference, September 17, **2021**
3. “Artificial Intelligence in Head and Neck Endoscopy,” European Organisation for Research and Treatment of Cancer (EORTC), Head and Neck Cancer Group Spring meeting, April 24, **2021**
4. “Connettività e operazioni a distanza: come cambia il mondo della chirurgia,” Podcast BB&C, March **2021**
5. “5G Telesurgery: Recent experience and the future of remote robotic surgery,” Simposio Sanità 5.0, 31° Congresso di Chirurgia dell’Apparato Digerente, November 19, **2020**
6. “CALM – computer-assisted laser microsurgery,” POLIMI Virtual Visit @IIT, November 11, **2020**
7. “ μ RALP & Beyond: Micro-Technologies and Systems for Robot-Assisted Endoscopic Laser Microsurgery,” ATLAS Capita Selecta seminar, online, November 9, **2020**
8. “Computer vision for enhanced perception and control in surgical applications,” Workshop: Integrating Sensor Fusion and Perception for Human-robot Interaction, IEEE RO-MAN 2020, Naples, Italy, September 1, **2020**
9. “Live usage of SVEI and CALM,” Techfest IIT Bombay, August 10, **2020**
10. “Surgical robotics research at IIT,” *Esaote meets IIT*, Esaote, Genova, January 29, **2020**
11. “Perception and actuation in the surgical field: sensors, vision, augmented reality, teleoperation and task autonomy,” Tutorial on Key Technologies for Autonomous Robotic Surgery, IEEE ICAR 2019, Belo Horizonte, Brazil, December 5, **2019**
12. “Medical Robots: Enabling Super-Human Capabilities for Precision Treatments,” Kezhixing Medical Robot Forum, Beijing, China, October 20, **2019**
13. “Robotic instruments: Enabling technology for augmented capabilities and surgical performance,” XLII Congress of the Italian Society of Surgical Oncology, Cagliari, Italy, September 9, **2019**
14. “Improving precision medical treatments with down-to-earth technology,” *Meet the Jury* seminar, KU Leuven, Belgium, June 12, **2019**
15. “Developing robotic healthcare solutions for market use,” DIH-HERO Deep Dive Workshop, Genoa, Italy, May 27, **2019**
16. “Hand-held device for inserting a needle into a non-homogeneous material, particularly for intravenous catheterization”, InnovAgorà 2019, MUIR Patent Event, Milano, Italy, May 8, **2019**
17. “Device for the spherical orientation of an optical element, in particular for directing a light beam, such as a laser beam”, InnovAgorà 2019, MUIR Patent Event, Milano, Italy, May 7, **2019**

18. "The Power of Light," session: Surgery and Technology 4.0, CRAS+SPIGC joint conference, Genoa, Italy, March 21, **2019**
19. "Liver graft steatosis assessment based on smartphone pictures," session: Transplantation, CRAS+SPIGC joint conference, Genoa, Italy, March 21, **2019**
20. "IIT-Ericsson collaboration @ Innovation Garage," Innovation Garage Inauguration Ceremony, Genoa, Italy, February 28, **2019**
21. "Tecnologie medicali: Ricerca ed innovazione a Genova," Genova Smart Week, November 22, **2018**
22. "Robotic Systems for Precision Medical Treatments," SMIT2018-IBEC2018, Seoul, Korea, November 8, **2018**
23. "Microsurgery Robots: addressing the needs of high-precision surgical interventions," Italy–Korea Bilateral Symposium on Medical Robotics, KAIST, Daejeon, Korea, November 6, **2018**
24. "MD Tech – A Medical Devices Technology Company", Start-Up Ideas, Keqiao, China, October 24, **2018**
25. "Laser Microsurgery Technologies: Current needs and potential solutions," lecture at the *IEEE COSUR Summer School*, Verona, Italy, July 13, **2018**
26. "Tecnologie IIT per le chirurgie di precisione," CoffeeTech, Confindustria, Genova, June 1, **2018**
27. "Computer-Assisted Technologies for Laser Microsurgery," International Symposium on Medical Robotics, Atlanta, USA, March 1, **2018**
28. "Assistive Robotic Systems for Medicine and Biology," North Carolina State University, Raleigh, USA, February 27, **2018**
29. "Medical Robotics – Current Activities & Potential Areas for Bilateral Collaboration," The 11th Korea–Italy Joint Committee on Science and Technology Cooperation, Seoul, Korea, November 28, **2017**
30. "La straordinaria robotica del futuro," Vodafone Technology Roadshow 2017, Milan, November 7, **2017**
31. "Il Mestiere del Ricercatore," Associazione Amici del Festival della Scienza, Genoa, October 20, **2017**
32. "Laser Microsurgery – Better with Robots?," KU Leuven, Belgium, June 9, **2017**
33. "Innovation in Medical Robotics: The IIT Experience," *Gynecological Robotic Surgery Club – 2nd Italian Meeting*, Genova, Italy, April 6, **2017**
34. "Surgical robotics for the benefit of humanity," IIT NEXT workshop, March 29, **2017**
35. "TEEP-SLA – Tecnologie Empatiche ed Espressive per Persone con SLA," *Congresso Nazionale SICP – Il Tempo delle Cure Palliative*, Rome, Italy, November 18, **2016**
36. "Robot-Assisted Laser Microsurgery," lecture at the *IEEE COSUR Summer School*, Verona, Italy, September 8, **2016**
37. "Robot-Assisted Transoral Laser Microsurgery: Enhancing Surgical Precision, Safety and Quality," *Robotics Research Jam Sessions*, Pisa, Italy, July 18, **2016**
38. "Robot-Assisted Laser Microsurgery: Overcoming Translational Barriers," *IEEE BIOROB 2016 Workshop in Surgical Robotics*, Singapore, June 26, **2016**
39. "Precision Medicine: the future of robotics in microsurgery," *Not Only Robotics... Minimally Invasive Digestive Surgery and Beyond*, Florence, Italy, June 7, **2016**
40. "Assistive Robotic Systems for Medicine and Biology," *Lecture at Medical School*, University of Genova, Genova, Italy, May 24, **2016**
41. "Robotic Systems for Medicine and Biology," *International Workshop on Cognitive Development for Friendly Robots and Rehabilitation*, Genova, Italy, December 2, **2015**
42. "Assistive Systems for Enhancing Surgical Safety, Precision and Quality," *University of Pavia*, Pavia, Italy, November 16, **2015**
43. "Human Centered R&D at the IIT's Biomedical Robotics Laboratory," *University College London*, London, UK, October 21, **2015**
44. "Detection and Classification of Laryngeal Tumors Using Endoscopic Narrow-Band Imaging," *Surgical Imaging, Guidance and Augmented Reality Workshop, The Hamlyn Symposium on Medical Robotics*, London, UK, June 20, **2015**

45. "Cognitive Modeling and Control in Laser Microsurgery," *Cognitive Surgical Robotics Workshop, The Hamlyn Symposium on Medical Robotics*, London, UK, June **2015**
46. "Human-Centered R&D at the Biomedical Robotics Lab" *Human-Centered and Rehabilitation Robotics Workshop*, Genoa, Italy, March 24, **2015**
47. "The μ RALP Project", *The 2015 Innovative Surgical Robotics Forum*, London, UK, March 18, **2015**
48. "Biomedical Technologies at the IIT – Technology Transfer Challenges and Opportunities", *Tecnologie Biomediche: Sfide e opportunità per l'Italia, MedTechCatalyst Forum*, Milan, Italy, October 23, **2014**
49. "Robot-Assisted Laser Microsurgery", *IEEE BioRob 2014 Workshop on Robotic Microsurgery and Image-Guided Surgical Interventions*, Sao Paulo, Brazil, August 12, **2014**
50. "Biomedical Robotics – From Single Cell Manipulation to Microsurgery," *IIT Scientific Planning Workshop*, Genoa, Italy, March 20, **2014**
51. "Un approccio robotico per microchirurgia della laringe e presentazione progetto μ RALP," *Chirurgia Robotica nella Sua Evoluzione*, Rapallo, Italy, September 28, **2013**
52. "The μ RALP approach to safer vocal cord surgeries," *Workshop on Safety in Robotic Surgery, Hamlyn Symposium*, London, UK, June 25, **2013**
53. "The Micro-RALP Project: New Technologies and Systems for Robot-Assisted Microsurgery," *Bioengineering12*, Oxford, UK, September 6, **2012**
54. " μ RALP – Micro-Technologies and Systems for Robot-Assisted Laser Phonosurgery," *European Commission FP7 Info Day*, Paris, France, December 1, **2011**
55. "Biomedical Robotics Research at the Italian Institute of Technology," *FEMTO-ST Institute, University of France-Comté*, Besançon, France, November 16, **2010**

PUBLICATIONS - THESIS

1. **Mattos**, L.S., "Towards the Automation of Embryonic Stem Cell Microinjections into Blastocysts," *Ph.D. Dissertation*, Department of Electrical and Computer Engineering, North Carolina State University, Raleigh, NC, May **2007** (Committee Chair: Dr. Edward Grant)
2. **Mattos**, L.S., "The EvBot II: An enhanced evolutionary robotics platform equipped with integrated sensing for control," *M.S. Thesis*, Department of Electrical and Computer Engineering, North Carolina State University, Raleigh, NC, May **2003** (Committee Chair: Dr. Edward Grant)

PUBLICATIONS - EDITORIALS

1. Manfredi, L., **Mattos**, L.S., Melzer, A., "Novel Actuators, Sensors and Control Systems for Endoscopic Robots," *Frontiers in Robotics and AI*, <https://doi.org/10.3389/frobt.2021.797467>, October, **2021**
2. Pereira, G.A.S., Drews, P.L.J., Wolf, D.F., **Mattos**, L.S., "ICAR 2019 Special Issue," *Journal of Intelligent & Robotic Systems*, vol. 102, article 88. <https://doi.org/10.1007/s10846-021-01460-9>, 23 July **2021**
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