



Sara Moccia

Personal information

Data and place of birth 2nd September 1990, Bari (BA), Italy,

Nationality Italian

Current position PhD Student at Department of Advanced Robotics, Istituto Italiano di Tecnologia, Genoa, Italy and Department of Electronics, Information and Bioengineering, Politecnico di Milano, Milan, Italy

Language proficiency Italian (Native speaker), English (Fluent), French (Basic communication skills)

Education

May 2015 – **PhD in Biomedical Engineering-Advanced Robotics.**

- present
Genoa (GE),
Italy
- o Department of Advanced Robotics - Istituto Italiano di Tecnologia / Department of Electronics, Information and Bioengineering - Politecnico di Milano
- Duration of the program of study: 3 years
- Project: *Supervised tissue classification in optical images: towards new applications of surgical data science*
- Supervisors: Leonardo S. Mattos, PhD Elena De Momi, PhD
- Milan (MI),
Italy

Sept 2012 – **Master of Science in Biomedical Engineering.**

- Dec 2014
Milan (MI),
Italy
- o Department of Electronics, Information and Bioengineering - Politecnico di Milano, 110/110 cum laude
- Duration of the program of study: 2 years
- Final Project: *Statistical segmentation techniques of liver metastases and necroses in FDG-PET for the automatic evaluation of pre and post thermo ablation PET/CT studies*
- Supervisor: Prof. Giuseppe Baselli

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🌐 <http://nearlab.polimi.it/medical/saram/>

in <https://www.linkedin.com/in/sara-moccia-b8294796/>

Work experience

Oct 2016 – **Internship as PhD student.**

- Mar 2017
Heidelberg,
Germany
- Computer-Assisted Medical Interventions (CAMI) - German Cancer Research Center (DKFZ)
 - Project: *Classification of abdominal tissues from in-vivo laparoscopic multispectral data*
 - Supervisor: Prof. Lena Maier-Hein

Jan 2015 – **Research Fellow.**

- May 2015
Milano (MI),
Italy
- Department of Electronics, Information and Bioengineering - Politecnico di Milano / Dipartimento di Neuroscienze - Niguarda Hospital
 - Project: *Electrode trajectory planning for StereoElectroEncephaloGraphy (SEEG)*
 - Supervisor: Elena De Momi, PhD

Training courses

June 2017 **NAMIC project week.**

- Catanzaro (CZ),
Italy
- MICCAI Society
 - Course: *25th NAMIC Project Week*

Aug 2016 **Summer school.**

- Favignana (TP),
Italy
- University of Cambridge, Università di Catania, King's College London
 - Course: *Medical Imaging Summer School 2016 - Medical Imaging meets Machine Learning*

Sept 2015 **Summer school.**

- Bressanone
(BZ), Italy
- Gruppo Nazionale di Bioingegneria
 - Course: *XXXIV Scuola Annuale del Gruppo Nazionale di Bioingegneria - Approcci ingegneristici per lo sviluppo di metodiche alternative alla sperimentazione in vivo*

July 2015 **Summer school.**

- Paris, France
- Institut Henri Poincaré
 - Course: *3rd Biomedical Image Analysis Summer School: Modalities, Methodologies & Clinical Research*

Nov 2013 **Athens programme.**

- Istanbul, Turkey
- Istanbul Teknik Universitesi
 - Course: *Radiation Physics and Environment*

Mar 2013 **Athens programme.**

- Prague, Czech
Republic
- Czech Technical University
 - Course: *Ionizing Radiation*

Teaching activity

Spring 2017 – **Seminars/Lectures.**

- present
Milano (MI),
Italy
- Department of Electronics, Information and Bioengineering - Politecnico di Milano
 - Course: *Image processing laboratory, Prof. Enrico Caiani* (Master of Science in Biomedical Engineering)
 - Course: *Technologies for motor behavior analysis and virtual modeling, Prof. Giancarlo Ferrigno* (Master of Science in Biomedical Engineering)

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Jan 2015 – **Tutoring.**
present ○ Department of Electronics, Information and Bioengineering - Politecnico di Milano
Milano (MI), Italy - Course: *Medical robotics and technologies for computer aided surgery laboratory, Elena De Momi* (Master of Science in Biomedical Engineering)

Jan 2015 – **Thesis supervision.**
present ○ Department of Electronics, Information and Bioengineering - Politecnico di Milano
Milano (MI), Italy ([Link to thesis description](#))

- Anna Morelli, **Intra-operative abdominal tissue registration for augmented reality applications**, Master of Science in Biomedical Engineering, ongoing
- Michele Gazzara, **Convolutional neural network models for axon segmentation in EM images**, Master of Science in Biomedical Engineering, 2017
- Gabriele Omodeo Vanone, **Learning-based classification of informative endoscopic frames with applications in laryngoscopy**, Master of Science in Biomedical Engineering, 2017
- Simone Foti, **Vessel Avoidance in Open Skull Robotic Neurosurgery through Deep Learning and Virtual Fixtures**, Master of Science in Biomedical Engineering, 2017
- Marco Guarnaschelli, Matteo Savazzi: **Machine learning for tissue classification in laryngeal endoscopic videos**, Master of Science in Biomedical Engineering, 2017
- Francesca Prudente, **Safety enhancement in neurosurgery**, Master of Science in Biomedical Engineering, 2017. Winner of PREMIO DI LAUREA, GRUPPO NAZIONALE DI BIOINGEGNERIA, the Italian award for the best Bioengineering thesis.

Scientific service

2016 – **Journal reviewer.**
present ○ Journal of Medical Robotics Research (World Scientific)
○ Medical & Biological Engineering & Computing (Springer)
○ Signal, Image and Video Processing (Springer)

2017 – **Workshop reviewer.**
present ○ CRAS Joint Workshop on New Technologies for Computer/Robot Assisted Surgery

Invited talks

June 2017 **Machine Learning Tools for Surgical Training and Situation Awareness.**
London, UK ○ E. De Momi, ..., S. Moccia, et al., *The Hamlyn Symposium on Medical Robotics, 2017*

Oct 2016 **Constrained Minimally Invasive Surgery.**
Daejeon, Korea ○ N. Enayati, V. Penza, S. Moccia, et al., *Workshop on Frontiers of Endoluminal Robotic Surgery, IEEE/RSJ International Conference on Intelligent Robots and Systems, 2016*

Technical skills

Libraries and Frameworks.

OpenCv, scikit-learn, Image Processing Toolbox Matlab, itk, Caffe, TensorFlow

Programming Languages.

C, C++, Python, Matlab Scripting, R Scripting

Operating Systems.

Ubuntu, Mac OS X, Windows

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Selected publications

- [1] Sara Moccia, Leonardo S. Mattos, Nicolas Poté, Federica Dondero, François Cauchy, Ailton Sepulveda, Olivier Soubrane, Elena De Momi, Alberto Diaspro, and Manuela Cesaretti. Computer-assisted liver graft steatosis assessment via learning-based texture analysis. *International Journal for Computer Assisted Radiology and Surgery*, Submitted.
- [2] Sara Moccia, Simone Foti, Arpita Routraym, Alessandro Perin, Raymond Sekula, Leonardo S. Mattos, Jeffrey Balzer, Wendy Fellows Mayle, Elena De Momi, and Cameron Riviere. Toward improving safety in neurosurgery with an active handheld instrument. *Annals of Biomedical Engineering*, Submitted.
- [3] Veronica Penza, Andrea S. Ciullo, Sara Moccia, Leonardo S. Mattos, and Elena De Momi. EndoAbS dataset: Endoscopic abdominal stereo image dataset for benchmarking 3D stereo reconstruction algorithms. *The International Journal of Medical Robotics and Computer Assisted Surgery*, Under review.
- [4] Sara Moccia, Elena De Momi, Sara El Hadji, and Leonardo S Mattos. Blood vessel segmentation algorithms – Review of methods, datasets and evaluation metrics. *Computer Methods and Programs in Biomedicine*, 158:71–91, 2018.
- [5] Sara Moccia, Gabriele O Vanone, Elena De Momi, Andrea Laborai, Luca Guastini, Giorgio Peretti, and Leonardo S Mattos. Learning-based classification of informative laryngoscopic frames. *Computer Methods and Programs in Biomedicine*, 158:21–30, 2018.
- [6] Sara Moccia, Sebastian J. Wirkert, Hanness Kenngott, Anant Vemuri, Martin Apitz, Benjamin Mayer, Elena De Momi, Leonardo S. Mattos, and Lena Maier-Hein. Uncertainty-aware organ classification for surgical data science applications in laparoscopy. *Transactions on Biomedical Engineering*, Under review.
- [7] Sara Moccia, Elena De Momi, Matteo Savazzi, Marco Guarnaschelli, Andrea Laborai, Luca Guastini, Giorgio Peretti, and Leonardo S Mattos. Confident texture-based laryngeal tissue classification for early stage diagnosis support. *Journal of Medical Imaging*, 4(03):034502–034502, 2017.
- [8] Sebastian J Wirkert, Anant S Vemuri, Hannes G Kenngott, Sara Moccia, Michael Götz, Benjamin FB Mayer, Klaus H Maier-Hein, Daniel S Elson, and Lena Maier-Hein. Physiological parameter estimation from multispectral images unleashed. In *International Conference on Medical Image Computing and Computer-Assisted Intervention*, pages 134–141. Springer, 2017.

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