



Sara Moccia

Personal information

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

Nationality Italian

Current position Postdoctoral researcher at the Department of Information Engineering, Università Politecnica delle Marche, Ancona (AN), Italy and at the Department of Advanced Robotics, Istituto Italiano di Tecnologia, Genoa (GE), Italy

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

Driving license

Work experience

May 2018 – **Postdoctoral researcher.**

Present
Ancona (AN), Italy
Genoa (GE), Italy

- o Department of Information Engineering - Università Politecnica delle Marche / Department of Advanced Robotics - Istituto Italiano di Tecnologia

Education

May 2015 – **European PhD cum laude in Bioengineering.**

April 2018
Genoa (GE), Italy
Milan (MI), 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 Prof. Elena De Momi

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

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

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

- Dec 2014
Milan (MI),
Italy
- o Department of Electronics, Information and Bioengineering - Politecnico di Milano
 - 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

Sept 2009 – **Bachelor of Science in Biomedical Engineering.**

- July 2012
Milan (MI),
Italy
- o Department of Electronics, Information and Bioengineering - Politecnico di Milano
 - Duration of the program of study: *3 years*
 - Final Project: *Calcolo di volume, massa e frazione di eiezione del ventricolo sinistro in pazienti affetti da infarto del miocardio a partire da immagini di risonanza magnetica cardiaca*
 - Supervisor: Prof. Enrico Caiani

Major collaborations

- o Prof. Elena De Momi, Department of Electronics, Information and Bioengineering, Politecnico di Milano, Milan, Italy
- o Leonardo S. Mattos, PhD, Biomedical Robotics Laboratory, Istituto Italiano di Tecnologia, Genoa, Italy
- o Prof. Cameron Riviere, The Robotics Institute, Carnegie Mellon University, Pittsburgh, US
- o Prof. Lena Maier-Hein, Department of Computer Assisted Medical Interventions, German Cancer Research Center, Heidelberg, Germany
- o Prof. Enrico Caiani, Department of Electronics, Information and Bioengineering, Politecnico di Milano, Milan, Italy

Involvement in international research projects

- o EDEN2020 (grant nos. 688279)
- o SMARTsurg (grant nos. 732515)
- o COMBIOSCOPY (project ID 637960)
- o U. S. National Institutes of Health (grant nos. R01EB000526)

Teaching activity

May 2015 – **Seminars/Lectures/Tutoring.**

- present *Milano (MI), Italy*
- o Department of Information Engineering - Università Politecnica delle Marche
 - Course: *Computer Vision*, Prof. Emanuele Frontoni (Master of Science in Computer Engineering)
 - Course: *Fondamenti di Informatica*, Prof. Primo Zingaretti (Bachelor of Science in Management Engineering)
 - o 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)
 - Course: *Medical robotics and technologies for computer aided surgery laboratory*, Prof. Elena De Momi (Master of Science in Biomedical Engineering)

Scientific services

2018 – **Member of Organizing Committee.**

- present
- o Joint Workshop on New Technologies for Computer/Robot Assisted Surgery

2018 – **Associate Editor.**

- present
- o International Conference on Robotics and Automation (IEEE)

2016 – **International Journal Reviewer** [PUBLONS profile](#) .

- present
- o The International Journal of Medical Robotics and Computer Assisted Surgery (Wiley)
 - o IEEE Journal of Biomedical and Health Informatics (IEEE)
 - o Journal of Medical Robotics Research (World Scientific)
 - o Medical & Biological Engineering & Computing (Springer)
 - o Signal, Image and Video Processing (Springer)
 - o IEEE Robotics and Automation Letters (IEEE)
 - o Robotics and Autonomous Systems (Elsevier)
 - o Journal of Medical Imaging (SPIE)
 - o Scientific Reports (Nature)

2016 – **International Conference Reviewer.**

- present
- o IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechanics (IEEE)
 - o Information Processing in Computer Assisted Interventions (Springer)
 - o Medical Imaging with Deep Learning

Technical skills

Libraries and Framework.

OpenCV, scikit-learn, ITK, VTK, Caffe, TensorFlow, Image Processing Toolbox Matlab

Programming Languages.

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

Operating Systems.

Ubuntu, Mac OS X, Windows

Awards

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June 2018 **Primaga 2018 - Artificial Intelligence applied to the analysis of medical images and videos**: 1500 € in the frame of the GNB 2018 congress to candidates that are 35 y.o. or younger and are both the first author and presenter of the winning paper. Sponsored by: Linkverse S.r.l. .
Milan, Italy

Sept 2018 **Gruppo Nazionale di Bioingegneria & PATRON**: 1200 € to the best Italian Bioengineering PhD Thesis (www.premignb2018.it) .
Bressanone, Italy

Invited talks

Oct 2018 **Artificial intelligence for decision-support systems.**

Milan, Italy ○ S. Moccia, Department of Information Engineering, Politecnico di Milano, Italy

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*

Journal publications

- [1] M. Vidotto, E. De Momi, M. Gazzara, L. S. Mattos, G. Ferrigno, and **S. Moccia**. "FCNN-based axon segmentation for convection-enhanced delivery optimization". In: (In press).
- [2] **S. Moccia**, R. Banali, C. Martini, G. Muscogiuri, G. Pontone, M. Pepi, and E. G. Caiani. "Development and testing of a deep learning-based strategy for scar segmentation on CMR-LGE images". In: *Magnetic Resonance Materials in Physics, Biology and Medicine* (In press).
- [3] M. Cesaretti, A. Z. Le Bian, **S. Moccia**, A. Iannelli, L. Schiavo, and A. Diaspro. "From deceased to bioengineered graft: New frontiers in liver transplantation". In: *Transplantation Reviews* (In press).
- [4] **S. Moccia**, S. Foti, A. Routraym, A. Perin, R. Sekula, L. S. Mattos, J. Balzer, W. Fellows Mayle, E. De Momi, and C. Riviere. "Toward Improving Safety in Neurosurgery with an Active Handheld Instrument". In: *Annals of Biomedical Engineering* 46.10 (2018), pp. 1450–1464.
- [5] **S. Moccia**, L. S. Mattos, N. Poté, F. Dondero, F. Cauchy, A. Sepulveda, O. Soubrane, E. De Momi, A. Diaspro, and M. Cesaretti. "Computer-assisted liver graft steatosis assessment via learning-based texture analysis". In: *International Journal for Computer Assisted Radiology and Surgery* 13.9 (2018), pp. 1357–1367.
- [6] V. Penza, A. S. Ciullo, **S. Moccia**, L. S. Mattos, and E. De Momi. "EndoAbS Dataset: Endoscopic Abdominal Stereo Image Dataset for Benchmarking 3D Stereo Reconstruction Algorithms". In: *The International Journal of Medical Robotics and Computer Assisted Surgery* doi:10.1002/rcs.1926.5 (2018), e1926.
- [7] **S. Moccia**, S. J. Wirkert, H. Kenngott, A. Vemuri, M. Apitz, B. Mayer, E. De Momi, L. S. Mattos, and L. Maier-Hein. "Uncertainty-Aware Organ Classification for Surgical Data Science Applications in Laparoscopy". In: *Transactions on Biomedical Engineering* doi:10.1109/TBME.2018.2813015.11 (2018), pp. 2649–2659.
- [8] **S. Moccia**, E. De Momi, S. El Hadji, and L. S. Mattos. "Blood vessel segmentation algorithms – Review of methods, datasets and evaluation metrics". In: *Computer Methods and Programs in Biomedicine* 158 (2018), pp. 71–91.

- [9] **S. Moccia**, G. O. Vanone, E. De Momi, A. Laborai, L. Guastini, G. Peretti, and L. S. Mattos. "Learning-based classification of informative laryngoscopic frames". In: *Computer Methods and Programs in Biomedicine* 158 (2018), pp. 21–30.
- [10] **S. Moccia**, E. De Momi, M. Savazzi, M. Guarnaschelli, A. Laborai, L. Guastini, G. Peretti, and L. S. Mattos. "Confident texture-based laryngeal tissue classification for early stage diagnosis support". In: *Journal of Medical Imaging* 4.03 (2017), pp. 034502–034502.

Conference/Workshop proceedings

- [1] **S. Moccia**, R. Banali, C. Martini, G. Muscogiuri, G. Pontone, M. Pepi, and E. G. Caiani. "Automated Scar Segmentation From Cardiac Magnetic Resonance-Late Gadolinium Enhancement Images Using a Deep-Learning Approach". In: *Computing in Cardiology*. IEEE. Accepted for publication.
- [2] S. J. Wirkert, A. S. Vemuri, H. G. Kenngott, **S. Moccia**, M. Götz, B. F. Mayer, K. H. Maier-Hein, D. S. Elson, and L. Maier-Hein. "Physiological Parameter Estimation from Multispectral Images Unleashed". In: *International Conference on Medical Image Computing and Computer-Assisted Intervention*. Springer. 2017, pp. 134–141.
- [3] D. Scorza, **S. Moccia**, G. De Luca, L. Plaino, F. Cardinale, L. S. Mattos, L. Kabongo, and E. De Momi. "Safe electrode trajectory planning in SEEG via MIP-based vessel segmentation". In: *SPIE Medical Imaging*. International Society for Optics and Photonics. 2017, pp. 101352C–101352C.
- [4] **S. Moccia**, V. Penza, G. O. Vanone, E. De Momi, and L. S. Mattos. "Automatic workflow for narrow-band laryngeal video stitching". In: *IEEE Annual International Conference of the Engineering in Medicine and Biology Society*. IEEE. 2016, pp. 1188–1191.

Signature:



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