

PERSONAL INFORMATION

De Momi Elena

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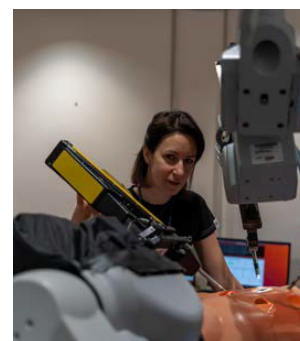
Scopus Author ID: 26022531200

Researcher ID: D-7375-2016 Date of birth: March 19th, 1978

Nationality: Italian

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(132 journal articles, 30 h-index, 2826 citations Scopus – 07/01/2022)



SCIENTIFIC TRACK RECORD

Soon after the PhD in 2006, with a thesis on computer-aided surgery planning, I significantly contributed to the introduction of the successful research line in robotics in healthcare at Politecnico di Milano, within the Neuroengineering and Medical Robotics Laboratory (NearLab). Then (since 2010, when I became head of the Medical Robotics Section of NearLab) I started doing research on the topics of 1) path planning, 2) physical human robot interaction in the medical field and 3) machine learning in computer vision for augmented reality in surgery.

In February 2020, the robotics Labs of the Department of Electronics, Information and Bioengineering joined the Leonardo Robotics Lab.

EDUCATION

2006 PhD Bioengineering, Bioeng. Department, Politecnico di Milano, Italy. “Computer Aided Surgery, Planning and Simulation”.

2002 MSc in Biomedical Engineering (98/100), Politecnico di Milano, Italy

CURRENT POSITION AND PREVIOUS POSITIONS

2022 – Affiliate to “Istituto Europeo di Oncologia”, Milan, Italy

2018 – today Associate Professor, Department of Electronics, Information and Bioengineering (DEIB), Politecnico di Milano (POLIMI), Italy (“National scientific qualification” for Full Professor in 09/G2 achieved on 16th 10 2018)

2010 – 2018 Assistant Professor, DEIB, POLIMI, Italy

2011 – 2014 affiliation to ITIA National Research Center, Milan, Italy

2006 – 2010 Post doc – research assistant, Bioeng. Department, Politecnico di Milano, Italy

FELLOWSHIP/ INTERNATIONAL EXPERIENCE

2019 – (Nov.) 1-week invited visiting Prof. at PPRIME Institute - IUT de Poitiers (HSE Dept.) University of Poitiers, France

2008 – 2018 Short-stay research periods at EU project partner Imperial College of London, UK

2005 (Three months) Visiting PhD student at Carnegie Mellon University, Pittsburgh, Pennsylvania, USA

2003 – 2004 (5 months) Scholarship, MEM Research Center, University of Bern, Bern, Switzerland, “automatic computation of mid-facial plane for CMF surgery planning”

NATIONAL AND INTERNATIONAL FUNDING

H2020 grants as PI

- Autonomous Robotics for Transcatheter dEliveRy sYstems (ARTERY) ICT-47-2020 101017140 (CO-PI for partner POLIMI 239583€) 2021 - 2023
- ATLAS (AuTonomous intraLuminAI Surgery) H2020 <https://atlas-itn.eu/> Marie Curie ITN- 813782 (523000€) 2019 - 2023

- ALPHA-STEM (Advanced Laboratory Phantoms for Soft Tissues in Engineering and Medicine) Marie Curie IF- 798244 (Project coordinator 200000 €) 2018 - 2021
- EDEN2020 (Enhanced Delivery Ecosystem for Neurosurgery in 2020) <http://www.eden2020.eu/> ICT-24-2015 688279 (700000€) 2016 - 2021

FP7 grants as PI

- EuRoSurge (European Robotic Surgery) ICT-2011-7-288233 (143000€) 2011 - 2013

Participation to H2020 and Fp7 grants

- SMARTsurg (SMart weArable Robotic Teleoperated Surgery) <http://www.smartsurg-project.eu/> ICT-26-2016 732515 2017-2021
- ACTIVE (Active Constraints Technologies for Ill-defined or Volatile Environments) FP7-ICT-2009-6-270460 2011-2015 (Project Manager)
- ROBOCAST (ROBOt and sensors integration for Computer Assisted Surgery and Therapy) FP7-ICT-2007-215190 2008-2010

PhD scholarships from companies and from the Italian Institute of Technology

- Machine learning in computer vision - Industrial project CosmoPharma 1 PhD scholarship (68 k€)
- ART 3.5D - Medtronic 1 PhD scholarship (Co-PI) (68 k€)
- Human robot interaction (surgery, assistive and rehabilitation robotics): supervisor of 15 PhD candidates (about 1M€) 2013-2024

Intuitive Technology award

- Machine Learning-based Adaptive Robot-assisted Training for Surgical Robotics (46 k€) 2017-2018

INSTITUTIONAL RESPONSIBILITIES

2020 - 2012 Member of the PhD Committee at Universidad Polit cnica de Catalu a, Barcelona, Spain; IIT, Genova, Italy; King's College of London, London, UK; Imperial College of London, London, UK; ISIR - Sorbonne University - CNRS - INSERM, Paris, France.

INTERNAL (IN POLIMI)

2018 – today responsible of the MSc in Biomedical Engineering students Study Plan assessment and approval

2017 – today Member of the PhD Bioengineering Committee

2014 – today serving as and Member of the Commission of Research Quality Assessment at DEIB

ORGANISATION OF SCIENTIFIC MEETINGS

2020 Co-organizer of the workshop “Integrating Sensor Fusion and Perception for Human-robot Interaction” THE 29TH IEEE INT. CONF. ON ROBOT AND HUMAN INTERACTIVE COMMUNICATION Sept. 1, 2020, Naples, Italy

2019 Scientific organization committee of the National Bioeng. PhD School “Technologies in surgery” Sept. 2019, Bressanone, Italy

2018 Coordinator of the local organizing committee of the “Italian Bioengineering Group” National Congress, Milan 25-27 June 2018

2017 – 2018 Co-organizer of workshops on Surgical Robotics at the European Robotic Forum (ERF)

2016 Co-organizer of the workshop “Towards Clinical Impact in Robotic Assisted Neuro and Skull- Base Surgery” at Hamlyn Symposium on Robotic Surgery, London, UK

2012 and 2010 Co-organizer of the workshop “Modular Surgical Robotics: how can we make it possible?” at 2012 IEEE ICRA, St Paul, Minnesota, USA and of the workshop “EU Surgical Robotics Projects” at 2010 IEEE ICRA, Anchorage, Alaska, USA

COMMISSIONS OF TRUST

Conference and Scientific Societies responsibility

2023 – Organizing Committee of the 2023 IEEE Int. Conf. of Rob. and Aut. (ICRA) to be held in London (Publication chair)
2022 – Invitation for SNSF Starting Grants STEM Panel (Switzerland)
2022 – Program Chair 2022 Int. Symposium on Medical Robotics (ISMR) Atlanta (Georgia, USA)
2020 – PC member of the Hamlyn Symposium of Medical robotics, London, UK (2020/ 2021/ 2022)
2021 – 30th International Joint Conference on Artificial Intelligence (IJCAI) Program committee
2019 – Publicity chair of the 2019 Int. Symposium on Medical Robotics (ISMR) Atlanta (Georgia, USA)
2019 – Publication co-chair of the 2019 IEEE ICRA held in Montreal (Canada) <http://www.icra2019.org>
2018 – Publication co-chair of the 2018 International Symposium on Medical Robotics (ISMR) held in Atlanta (Georgia, USA) <http://ismr2018.gatech.edu>
2015 – today Computer Assisted Orthopedic Surgery (CAOS) Conference Committee Member
2014 – today Member of the Technical Committee in Biorobotics (IEEE EMB Society) (elected)

Indexed Journal editorial board

2021 – Frontiers in Robotics and AI 2021 Outstanding Associate Editor Award.
2021 – Nominated in the editorial board of IEEE Transaction on Robotics
2020 – Nominated in the editorial board of Robotica
2019 – Nominated in the editorial board of IEEE Robotics and Automation Magazine (editor in 2022)
2018 – Associated Editor of Medical and Biological Engineering and Computing journal
2018 – Editor of the Journal of Medical Robotics Research (JMRR)
2016 – today Associate Editor of the 2016, 2017 and 2018 IEEE ICRA and IEEE/RSJ IROS and 2018 IEEE BioRob
2016 – today Editorial Board, Frontiers in Robotics and AI and of the J. Medical Robotics Research
2014 – today Editorial Board, Int. Journal of Advanced Robotic Systems

Expert reviewer and evaluator

2013 – today Expert Evaluator for Research for the benefit of SMEs for the EU, Expert for FET H2020, MSCA Horizon EU, Expert for ICT Robotics H2020
2010 – today Expert, Reviewer of FP6 and FP7 (VPH – ICT for HEALTH – ICT Robotics) for the EU

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

2019 – today National Group of Bioengineering
2019 – today Italian Institute of Robotics and Intelligent Machines
2017 Elevation to the grade of *Senior Membership* from IEEE society (Only about 9% of total membership have achieved this prestigious grade)
2012 – today Member, IEEE Robotics and Automation Society and Eng. Med. Biol. (EMB) Society

INVITED PERSONAL PRESENTATIONS

I was invited to several ICRA/ MICCAI workshops during the last 10 years.

I was invited and received travel funding at:

1. Nov. 2018 Italian-Korea scientific symposium on Surgical Robotics organized by the Italian Embassy in South Korea
2. Intuitive Surgical, Sunnyvale (CA, USA) Education and Training Research Grant Symposium Jan 18th and 19th, 2018 “Machine learning-based adaptive robot-assisted training for surgical robotics”
3. SMIT 29TH Conf. of the Int. Society for Medical Innovation and Technology - Turin 9-10 2017 lecture on: “Computer vision and robotics for augmenting the surgeon’s capabilities during the intervention”
4. Comp. Sciences for Medicine Residential Workshop, Dec 12-14 2016 in Luxembourg by Prof. Stephan Bordas

I was invited for

- **plenary talk** “Embedding AI in robotic surgery” at MESROB 2021 (Virtual conference) 07.-09. June 2021

-semi-plenary talk at 2018 Int. Symposium on Medical Robotics (ISMR) Atlanta (GA, USA) “Smart Technologies for neurosurgical diagnosis and procedure planning”.

Prizes/ Awards/ Academy memberships.

2015 Best paper “Adaptive Hands-On Control for Reaching and Targeting tasks in Surgery” Int. J. Advanced Robotics IJARS's Women in Robotics award

2015 (Second Place Best Paper Award) Best paper Joint Workshop in Computer/ Robotic Ass. Surg. During CRAS, Brussels, Belgium

2014 (Second Place Best Paper Award) ASME Student Mechanism and Robot Design Competition

Patents

WO2008129414 (A2) — 2008-10-30 Istituto Ortopedico Galeazzi; Ferrigno G.; Cerveri P.; **De Momi E.**; Pascale

Technology Transfer activities

- I established an “executive PhD” with Vicomtech (Spain) and obtained a research grant from Medtronic (USA) for a PhD student in 2017.

- I have been awarded by the Intuitive Surgical Technology Grant USA in year 2017

SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

2006 – today Supervision of approx. **70** Master Students (MSc in Biomedical Engineering/ Automation/ Electronics Engineering at POLIMI).

Supervision of **8** Erasmus MSc Students from University of Minho, Delft University of Technology, Telecom Physique Strasbourg.

13 graduated **PhD students** + 2 Erasmus PhD student

Currently supervising **17** PhD candidates (11 of them I am main supervisor), working on robotic interfaces, skill assessment and motor control, computer vision and **7** PhD students funded by the Chinese Science Council

Currently supervising 1 Postdoc who graduated in POLIMI and 1 visiting Postdoc (2 years) from Università della Calabria

TEACHING ACTIVITIES

MSc Biomedical Engineering at POLIMI

2021 – now **Teaching position** – SMART HOSPITAL, 3CFU offered to all MSc students, POLIMI, Italy

2017 – now **Teaching position** – Clinical Technology Assessment, 5CFU at MSc in Biomedical Engineering, POLIMI, Italy

2016 – now **Teaching position** – Lab course: Medical Robotics and Technologies for Computer Aided Surgery, 5CFU at MSc in Biom. Eng, POLIMI, Italy

BSc Biomedical Engineering at POLIMI

2013 – 2016 **Teaching position** – Project mgm. on Instrumentation and Functional Evaluation, 5CFU at BSc in Biom. Eng, POLIMI, Italy

Course responsibilities at PhD Bioengineering at POLIMI

2020 – ATLAS - ITN 1 week course “From pre- to intra-operative image analysis: 3D tissue segmentation, modeling and deformation”

2017 – 2018 “Human-robot collaboration for professionals and daily life”

2014 – 2015 “Human friendly robotics”

2012 – 2013 “Modular surgical robotics”

2011 – 2012 “Advancements in surgical robotics”

Course responsibilities at PhD Mathematics and Information at Università della Calabria

2020 and 2021 – 2 week course: “Embodiment of AI”