Angela Faragasso

Postdoctoral research fellow in Robotics
Associate Editor for IEEE Robotics & Automation Magazine
Service Robotics Lab, Department of Precision Engineering, Graduate School of Engineering, The University of Tokyo.

Work address	Personal details
Department of Precision Engineering, School of Engineering, Room #826, Engineering Building #14, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8656, Japan Tel：+81-(0)3-5841-6486 faragasso@robot.t.u-tokyo.ac.jp https://angelafaragasso.com/	玉泉館II 〒113-0033 Tōkyō-to, Bunkyō-ku, Hongō, 6 Chome−19−14 Num. 405 Tel：+81-(0)3-3485-1980 DoB: 18 September 1986|| Gender: female Angelafar86@gmail.com Tel：+81-(0)837221809 Nationality: Italian

Current Work:

Postdoctoral research fellow	Service Robotics Lab, Department of Precision Engineering, Graduate School of Engineering, The University of Tokyo, Tokyo, Japan. PIs: Prof. Asama Hajime	11/2018 – Present
JSPS post-doctoral research fellow	Service Robotics Lab, Department of Precision Engineering, Graduate School of Engineering, The University of Tokyo, Tokyo, Japan. Project Title: Vision-based sensing mechanism for assistive and rescue robots. PIs: Prof. Asama Hajime	11/2016 – 10/2018
Associate Editor	IEEE Robotics & Automation Magazine	1/2018 – Present

Academic qualifications:

PhD in Robotics King's College London Thesis title: *Vision-based Sensing Mechanism for Soft Tissue Stiffness Estimation*	14/11/2012 - 28/06/2016
Master in Artificial Intelligence and Robotics La Sapienza, University of Rome (including eight months abroad periods at the Texas A&M) Thesis title: *Vision Control For Humanoid Navigation in Office-Like Environments*	1/1/2010 - 26/07/2012
Bachelor in Computer Science Engineering La Sapienza, University of Rome Thesis title: *Online Applications to compile evaluations boards about Courses and the Teachers*	22/09/2006 - 18/11/2009

Previous Work:

Research Associate	Centre for Robotics Research, Dept. of Informatics, KCL, UK Project Title: Motion PIs: Prof. Thrishantha Nanayakkara	6/2016 – 10/2016
Research Associate	Centre for Robotics Research, Dept. of Informatics, KCL, UK Project Title: FourbyThree PIs: Prof. Kaspar Althoefer	01/2016 – 06/2016
Lead Robotics Advisor	Imperial College London Exhibition Road, London, UK SW7 2AZ	09/2015 – 10/2016

Reader/ Exam Support	Dept. of Informatics, KCL, UK Teaching support to a visually impaired undergraduate student in Computer Science with Robotics	04/2014 – 08/2016
Teaching Assistant	Dept. of Informatics, KCL, UK First Order Logic, Robotics System, Data Structures, Computer System, AI, Foundations of Computing, Elementary Logic with Applications, Sensor and Actuators, Real Time Systems and Control	01/2013 – 7/2016

Grants & awards:

Grant: Grants-in-Aid for Scientific Research (2.3 million yen)	2016 - 2018
Fellowship: Japan Society for the Promotion of Science (JSPS) Postdoctoral Fellowship for Overseas Researchers (Standard)	2016
Award: CRAS best poster award "Clip-on stiffness sensor for endoscopic cameras retrieving sense of touch in minimally invasive intervention".	2016
Scholarships: RosConf Diversity Scholarship	2016
PhD Scholarship EU FP7 project STIFF-FLOP: "STIFFness controllable Flexible and Learnable manipulator for surgical Operations"	2012
Engineering and Physical Sciences Research Council Award (EPSRC)	2012/2015
Scholarships for mobility to Texas A&M University	2010

Conferencing & research review roles:

Session Chair for:

- Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2018),
- International Symposium on System Integration (SII 2017).

Organiser of the Workshop

Human-Aiding Robotics: open issues and future direction (IROS 2018).

Member of the Award Committee for:

- International Symposium on System Integration (SII 2017).

Reviewer for:

- IEEE Transactions on Robotics (TRO),
- IEEE Transactions on Instrumentation & Measurement,
- Robotics and Computer Integrated Manufacturing,
- Journal of Intelligent and Robotic Systems,
- IEEE Robotics and Automation Letters (RA-L),
- IEEE International Conference on Robotics and Automation (ICRA),
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS),
- Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC),
- Hamlyn Symposium on Medical Robotics,
- International Conference on Ubiquitous Robots and Ambient Intelligence (URAI),
- International Journal of Biosensors & Bioelectronics,
- Workshop on New Technologies for Computer/Robot Assisted Surgery (CRAS),
- Robotics Science and System (RSS),
- International Symposium on System Integration (SII),
- IEEE Sensors,

- Robotics and Autonomous Systems (ELSEVIER),
- Soft Robotics (SoRo),
- Sensors MDPI.

Invited contributions:

Invited talks:

Seminar @ Tongji University	Vision In the loop	Shanghai, China	7/6/2018
ICRA Workshop on Innovative Haptic Interfaces emerging from Soft Robotics	Towards stiffness sensors for minimally invasive surgery	Singapore	2/6/2017

Invited exhibitions:

Service robots in MIS	SCHUNK Expert Days: Robots with Impact	Hausen, DE	2014
Surgical Robots	"Robots Live!" at the National Museum of Flight, National Museums Scotland	Edinburgh, UK	2014
Bio-inspired robotics in MIS	"Robot Safari^{EU}" (European Robotics Week), Science Museum London	London, UK	2013

Competences, training & skills:

- **Continuous participation** in training courses to enhance my **intellectual abilities** and **techniques** to do research and teaching, personal effectiveness, research governance/organisation, and my engagement skills to work with others. Moreover, I have been involved in the organisation of different open days to enhance the interest of young generation in Robotics.
- Attendance of **training course:** "Matlab Robotics Toolbox", "ROSConf2016", "LabVIEW".
- IT Skills:
  - Programming Language: Robot Operating System (ROS), C/C++, Python, Java, SQL, Assembly, Lisp, Cobol, Android, Prolog.
  - CAD Software: SolidWorks, Abaqus FEA, Illustrator.
  - Operating System: Windows, Linux, MacOS.
  - IDE: OpenCV, OpenGL, LabView, RoboRealm.
  - Robot simulation environments: Rviz, Simulink, SOFA framework (Simulation Open Framework Architecture), Webots, Simulink.
  - Microsoft Office, LaTex, Adobe Products, Beamer.
- Language Skills: Italian, English, basic Japanese.
- Artistic and other competences and interests: music, travelling, fitness, politics/news.

Brief description of my roles at the University of Tokyo:

- Post-doctoral research fellow in the Service Robotics Lab, Department of Precision Engineering, Graduate School of Engineering, The University of Tokyo.
- Exploration of novel visual-based technologies for search and rescue robots.
- Staff member of the **ImPACT**: Impulsing Paradigm Change through Disruptive Technologies Program.
- Supervision of international student for the **RoboCup@Home**.
- Supervision of PhD student in "**Mobile Robot Fault Detection combining different localization method**".
- Supervision of a Master student in "**Iterative Energy Shaping of Port-Hamiltonian Systems**".
- Supervision of international student in **"Visual-based navigation for small sized humanoid robot"**.

Brief description of my roles at King's College London:

- Research Associate within the **EU FP7 project**.

- PhD scholarship students within the **EU FP7 project** STIFF-FLOP responsible for hard- and software integration of **embedded sensors** into a **medical soft manipulator** in ROS (Robot Operating System).
- **Advisor/mentor** of **BSc and MSc and PhD** at King's CoRe.
- **Teaching Assistant** for undergraduate/postgraduate courses giving lectures/tutorials/lab demonstrations:
  Robotic Systems, Distributed Systems, Real Time System, Foundations of Computing, Elementary Logic with Applications, Adaptive and Robotics Systems, Programming Practice, Computer Systems, Artificial Intelligence.
- Lecturer/mentor for post-16 students from **under-represented groups** teaching "Mobile robots" (Hands-on lectures using the Khepera mobile robot), K+ **widening participation**.
- Lecturer/mentor in Robotics Open Day, Robotics Competition and Maths School Club teaching "Mobile robots" (Hands-on lectures using the Lego Mindstorm/ev3 mobile robot).
- Co-organiser of **invited** STIFF-FLOP **demonstrations** at the **Science Museum**, the **SCHUNK Expert Days** & the **British Science Festival**.

Research profile:

i. Collaborative research

My experience in collaborative research started during my master as I had the opportunity to join the Center for Robot-Assisted Search and Rescue (CRASAR) at the Texas A&M University under the supervision of Prof. Robin Murphy. During the time in Texas I implemented a real-time visual servoing for the Mesa Element, a mine rescue robot. My master thesis focused on the implementation of a visual-servoing algorithm for humanoid navigation in human-like environments. I am still in contact with both, Prof. Robin Murphy and my supervisors in Rome, Prof. Alessandro De Luca and prof. Giuseppe Oriolo. My PhD research, which has been founded by the European project Stiff-Flop and the Engineering and Physical Sciences Research Council Award (EPSRC), focused on the development of a visual-based stiffness sensing mechanism for medical diagnosis. Being part of an EU project gave me the opportunity to establish contacts and collaborate with different partners, twelve among universities and industries. Currently, I am also working for the ImPACT project which aims to develop essential technologies for remote autonomous robots that are tough and can function without faltering even in an extreme disaster conditions. Moreover, high collaboration between the universities and the industries is required to obtain successful outcome.

ii. Research experience

Over the past years, I have been working in different fields of robotics applications, such as humanoids, rescue and medical robotics. What has always been a constant in my research, is the use of image processing algorithm to perform autonomous control or to understand properties of the object in the environment, i.e. stiffness, in real-time. During my work at King's College London, I have performed research in the areas of **medical robotics** sensor fusion and control (as part of my responsibilities in EU project STIFF-FLOP).

Medical robotics:

- I developed a small **add-on sensor** for **laparoscopic cameras** able to compute the stiffness of soft tissues during palpating procedures.
- I have created an **innovative multiaxial palpation device** which employs visual feedback to compute indentation forces which are used to characterise the mechanical properties of the external surface.

Rescue and assistive robotics:

- I developed a vision-based fuzzy controller for mine rescue robots.
- I developed a visual **servoing algorithm for humanoid navigation** in human like environments.

Sensor fusion and robot control:

- I integrated the sensors developed at king's (force and bending sensors in a ROS system map)
- I have been involved in the implementation of a close loop control of a soft robot placed on the tip of the Schunk robot arm.

iii. Research prospects

I want to explore sensing mechanism which can furnish robotics systems with the same **sensory feedback** of humans. This can help to improve the **ergonomics** of robotics devices; besides it can be beneficial for applications in which human's intervention is not possible or burdensome.

I want to focus in the **intellectually challenging field** of creating new **innovative technologies** to **enhance user experience**.

- I would like to explore **visual-based solution** and sensor fusion in different robotics search applications.

- I would like to explore and improve the **awareness of the robot during navigation in unknown environments** by introducing novel vision based sensing technologies.
- I would love to teach and supervise students to inspire them and explore new potential application.