Giacomo De Rossi, Ph.D.

Personal Data

Place and Date of Birth:	Verona, Italy | 8 September 1990
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Work Experience

Current	**Position**: *Post-Doc Researcher* at *University of Verona* and *Needleye S.r.l.* **Project**: *ROBIOPSY* european project **Topic**: Software developer and AI specialist for the development of a novel robotic platform for guided prostate biopsy.
Aug. 2022 - Jul. 2023	**Position**: *Project Manager and Developer* at *ThermalX* **Company**: *ThermalX* is developing and testing a novel 3D thermal endoscopic camera to offer surgeons advanced warnings during *minimally-invasive surgery* (MIS). The temperature information provided by the camera will decrease failure rates for some of the most common intraluminal surgery operations.
Nov. 2021 - Sept 2022	**Position**: *Project Manager and Developer* at *NeedlEye S.r.l.* **Project**: *Robin* Total Knee Replacement platform (TKR) by *Orthokey S.r.l.* (Italy) and *United Orthopedic Corp.* (Taiwan) **Topic**: Design, develop, and test a *cobotic* platform to assist surgeons during total knee replacement (TKR) operations. The platform had to be *compliant* for direct manipulation and *precise* to position a cutting board on a virtual plane next to the patient's knee.
2019-2022	**Position**: *Post-Doc Researcher* at University of Verona **Project**: *SARAS (Smart Autonomous Robotic Assistant Surgeon) European project* **Topic**: Development and testing of advanced control system for the future of robotic applications in the operating room.
June 2016	*Hamlyn Surgical Robot Challenge 2016* **Task**: Integrate the soft robotic manipulator "StiffFlip" by the Scuola Superiore Sant'Anna, Pisa, with the daVinci Research Kit surgical platform.
Mar. - Sept. 2016	**Position**: *Research assistant* at *Altair Robotics Laboratory*, University of Verona **Project**: *MURAB (MRI and ultrasound robotics assisted biopsy) European project* **Topic**: Improve precision and effectiveness of the biopsy gathering for cancer diagnostic operations.

Task: Developing software for bilateral teleoperated guidance of the Intuitive DaVinci® surgical robot within the ROS framework in C++ and Python

2013-2015 **Position**: *Research assistant* at *Altair Robotics Laboratory*, University of Verona
Project: *I-SUR (Intelligent SUrgical Robotics) European project*
Topic: Develop general methods for cognitive surgical robots capable of combining sensing, dexterity and cognitive capabilities to carry out autonomously simple surgical actions, such as puncturing, cutting and suturing.
Task: Developing software components in both ROS and OROCOS frameworks (C, C++, Python and Lua languages) to operate autonomous and teleoperated tasks involving stereo camera-guided suturing. Participated in the final review at the ETH in Zürich to integrate the software developed by all the partners around Europe.
Supervisor: prof. Paolo Fiorini

Education

May 2020 Ph.D. in Computer Science, *University of Verona*.
Thesis title: Gesture Recognition and Control for Semi-Autonomous Robotic Assistant Surgeons

November 2019 Article "Cognitive Robotic Architecture for Semi-Autonomous Execution of Manipulation Tasks in a Surgical Environment" presented at IROS 2019
Macau, MSAR, China

Sept. - Dec. 2018 Ph.D. study abroad period at Oxford Brookes University, *Oxford*, U.K.: the candidate improved his knowledge on machine learning techniques for action recognition in heterogeneous scenarios

December 2017 Hamlyn Winter School 2017,
Imperial College, *London*, U.K.

July 2017 Article "A bilateral teleoperation architecture using Smith predictor and adaptive network buffering" presented at IFAC 2017 World Congress
Toulouse, France

July 2017 SIDRA 2017 Summer School on Formal methods and Port-Hamiltonian Control Systems
Bertinoro, Italy

December 2016 Lucia 2016 Winter School on Artificial Intelligence and Robotics
Örebro University, *Örebro*, Sweden

March 2016 Title: *Master's Degree* in Computer Science and Engineering,
Embedded Systems curriculum, **University of Verona**
Thesis: "A Bilateral Teleoperation Architecture Using Smith Predictor and Adaptive Network Buffering"
Grade: 106/110
Supervisor: dott. Riccardo Muradore

August 2014	Tohoku Engineering Summer School (TESP) - Robotics **Tohoku University**, Sendai, Japan
December 2012	**Title**: *Undergraduate Degree* in Computer Science Multimedia curriculum, **University of Verona** **Thesis**: "Network delay simulation in OROCOS" **Grade**: 104/110 **Supervisor**: prof. Paolo Fiorini

Computer Skills

Programming:	*C, C++, C#, Python, and* MATLAB Used within the frameworks ROS, OROCOS, TensorFlow, PyTorch for various European projects (namely i-SUR, MURAB, StiffFlop, and SARAS). *NVIDIA* CUDA *and OpenCL* Learnt during the academic courses and applied into a project regarding the N-Body simulation problem. SystemC and VHDL, Learned during the academic courses and applied into a project regarding the testing of embedded system designs using randomly-generated signals. Java Used in the programming of the Sunrise OS platform by KUKA GmbH under the *Robin* project
Typewriting Languages:	LaTeX
Operating Systems:	Windows, Linux-based, Mac OS and Unix-based.

Languages

Italian:	Mother tongue
English:	Fluent spoken and written

Main Scientific Publications

De Rossi, Giacomo, Marco Minelli, Serena Roin, Fabio Falezza, Alessio Sozzi, Federica Ferraguti, Francesco Setti, Marcello Bonfé, Cristian Secchi, and Riccardo Muradore (2021). "A First Evaluation of a Multi-Modal Learning System to Control Surgical Assistant Robots via Action Segmentation". In: *IEEE TRANSACTIONS ON MEDICAL ROBOTICS AND BIONICS* 3, pp. 714–724. DOI: 10.1109/tmrb.2021.3082210. URL: https://ieeexplore.ieee.org/document/9437343.

Falezza, Fabio, Nicola Piccinelli, Giacomo **De Rossi**, Andrea Roberti, Gernot Kronreif, Francesco Setti, Paolo Fiorini, and Riccardo Muradore (2021). "Modeling of Surgical Procedures Using Statecharts for Semi-Autonomous Robotic Surgery". In: *IEEE TRANSACTIONS ON MEDICAL ROBOTICS AND BIONICS* 3, pp. 888–899. DOI: 10.1109/tmrb.2021.3110676. URL: https://ieeexplore.ieee.org/document/9530457.

Roberti, Andrea, Nicola Piccinelli, Fabio Falezza, Giacomo **De Rossi**, Stefano Bonora, Francesco Setti, Paolo Fiorini, and Riccardo Muradore (2021). "A Time-of-Flight Stereoscopic Endoscope for Anatomical 3D Reconstruction". In: *2021 International Symposium on Medical Robotics, ISMR 2021*, pp. 1–7. ISBN: 978-1-6654-0622-2. DOI: 10.1109/ISMR48346.2021.9661478.

De Rossi, Giacomo (2020). "Gesture Recognition and Control for Semi-Autonomous Robotic Assistant Surgeons". PhD thesis.

De Rossi, Giacomo, Serena Roin, Francesco Setti, and Riccardo Muradore (2020). "A Multi-Modal Learning System for On-Line Surgical Action Segmentation". In: *International Symposium on Medical Robotics ISMR*, pp. 1–7.

Minelli, Marco, Alessio Sozzi, Giacomo **De Rossi**, Federica Ferraguti, Francesco Setti, Riccardo Muradore, Marcello Bonfé, and Cristian Secchi (2020). "Integrating Model Predictive Control and Dynamic Waypoints Generation for Motion Planning in Surgical Scenario". In: *IEEE/RJS INTERNATIONAL CONFERENCE ON INTELLIGENT ROBOTS AND SYSTEMS*, pp. 3157–3163.

De Rossi, Giacomo, Marco Minelli, Alessio Sozzi, Nicola Piccinelli, Federica Ferraguti, Francesco Setti, Marcello Bonfé, Cristian Secchi, and Riccardo Muradore (2019). "Cognitive Robotic Architecture for Semi-Autonomous Execution of Manipulation Tasks in a Surgical Environment". In: *IEEE/RJS INTERNATIONAL CONFERENCE ON INTELLIGENT ROBOTS AND SYSTEMS*, pp. 7827–7833. ISBN: 978-1-7281-4004-9. DOI: 10.1109/IROS40897.2019.8967667.

De Rossi, Giacomo, Francesco Setti, Riccardo Muradore, and Fabio Cuzzolin (2019). "Surgical Action Recognition with Spatiotemporal Convolutional Neural Networks". In: *Hamlyn Symposium on Medical Robotics*, pp. 33–34.

Sozzi, Alessio, Marcello Bonfé, Saverio Farsoni, Giacomo **De Rossi**, and Riccardo Muradore (2019a). "Dynamic Motion Planning for Autonomous Assistive Surgical Robots". In: *12th International Workshop on Human-Friendly Robotics (HFR 2019)*, pp. 1–15.

– (2019b). "Dynamic Motion Planning for Autonomous Assistive Surgical Robots". In: *ELECTRONICS* 8, pp. 1–24. DOI: 10.3390/electronics8090957.

April 4, 2024