Jacopo Serafin

Curriculum Vitae

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Education and Qualifications

Jan 2017–Today **Research Scientist**, *Toyota Research Institute*, Ann Arbor, MI 48109, USA.
Research fields: 3D Robot Perception, Autonomous Driving, Dynamic Object Tracking.

Aug 2015–Feb 2016 **Research Scholar**, *University of Michigan*, Ann Arbor, MI 48109, USA.
Host: Prof. E. Olson, APRIL Robotics Lab.

2013–2017 **Ph.D. in Engineering in Computer Science**, *Sapienza University of Rome*, Rome, Italy.
Research fields: Robotics, Localization, Mapping, SLAM, 3D Robot Perception; Advisor: Prof. G. Grisetti.

2011–2013 **Master of Science in Artificial Intelligence & Robotics (ISCED 5)**, *Sapienza University of Rome*, Rome, Italy, 110/110 cum laude.

2007–2010 **Bachelor's Degree in Engineering in Computer Science (ISCED 5)**, *Sapienza University of Rome*, Rome, Italy, 102/110.

2002–2006 **High School Diploma (ISCED 3)**, *Industrial Technical Institute "Giancarlo Vallauri"*, Velletri (Rome), Italy, 100/100.

Skills and Experience

Computing and Robotics

- Developed a C++ open source library for 3D point cloud registration, based on a variant of the Iterative Closest Point (ICP) algorithm: `http://www.jacoposerafin.com/nicp`;
- Developed and tested software on the following robots: Videre Erratic, Kuka YouBot, Mesa Element, Pioneer 3-AT and custom robotics platforms;
- Good knowledge of robotics libraries and tools: LCM, ROS, OpenCV, PCL;
- Good knowledge of programming languages: C++, C, Java, Assembly, OpenGL, Matlab, Bash;
- Good experience in building electronic circuits;
- Daily use of version control software, such as GIT and SVN;
- Knowledge of functional and logic programming languages: Lisp, Prolog;
- Knowledge of programming languages for web: HTML, CSS, PHP;
- Daily use of Unix/Linux, Windows, OSX and Robotics embedded Operating Systems;
- Good experience with IDEs and productivity applications: Emacs, Netbeans, Eclipse, Visual Studio, LaTeX, Microsoft Office, LibreOffice.

Communication

- Presented research results and projects at conferences and international events;
- Completed teaching activities (assistant) for courses in Robotics and base C programming.

Teamwork

- Involved as a member of the SPQR team during the RoCKIn@Work robot competitions;
- Active participation as member of the Ro.Co.Co. Laboratory at Sapienza University of Rome;
- Active participation as member of the European Project ROVINA (Robots for Exploration, Digital Preservation and Visualization of Archeological Sites)
- Good ability to adapt to multicultural environments, staying in contact with many people from different cultures and backgrounds.

Organizing

- Contributed to the coordination of important demos for international projects (ROVINA) or as a volunteer (RSS and other local events);
- Managed to regularly meet the deadlines of the Ph.D., research and teaching duties.

Languages

Italian **Mother tongue**

English **C1**

Teaching

Spring 2016 **Teaching Assistant, "Tecniche di Programmazione"**, *Sapienza University of Rome*, Italy.
Base C programming.

Spring 2015 **Teaching Assistant, "Tecniche di Programmazione"**, *Sapienza University of Rome*, Italy.
Base C programming.

Fall 2014 **"Robot Programming" Lesson: "3D Data Processing"**, *Sapienza University of Rome*, Italy.
3D point cloud registration.

Scientific Activities

Research Interests: Mobile Robotics, Field Robotics, Service Robotics, Localization, Mapping, SLAM, 3D Robot Perception, Computer Vision.

Publications

[1] J. Serafin and G. Grisetti. Using extended measurements and scene merging for efficient and robust point cloud registration. *Robotics and Autonomous Systems (RAS)*, 92:91–106, 2017.

[2] J. Serafin. *Using Extended Measurements and Geometric Features for Robust Long-Term Localization and Mapping*. PhD thesis, Department of Computer, Control, and Management Engineering "Antonio Ruberti" at Sapienza University of Rome, Rome, Italy, 2 2017.

[3] J. Serafin, E. Olson, and G. Grisetti. Fast and robust 3d feature extraction from sparse point clouds. In *Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, pages 4105–4112, Daejeon, Korea, 2016.

[4] J. Serafin, M. Di Cicco, T. M. Bonanni, G. Grisetti, L. Iocchi, D. Nardi, C. Stachniss, and V. A. Ziparo. Robots for exploration, digital preservation and visualization of archeological sites. In L. Bordoni, F. Mele, and A. Sorgente, editors, *Artificial Intelligence for Cultural Heritage*, chapter 5, pages 121–140. Cambridge Scholars Publishing, 2016.

[5] R. Goeddel, C. Kershaw, J. Serafin, and E. Olson. Flat2d: Fast localization from approximate transformation into 2d. In *Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, pages 1932–1939, Daejeon, Korea, 2016.

[6] J. Serafin and G. Grisetti. Nicp: Dense normal based point cloud registration. In *Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, pages 742–749, Hamburg, Germany, 2015.

[7] R. Capobianco, J. Serafin, J. Dichtl, G. Grisetti, L. Iocchi, and D. Nardi. A proposal for semantic map representation and evaluation. In *Proc. of the European Conference on Mobile Robots (ECMR)*, pages 1–6, Lincoln, United Kingdom, 2015.

[8] V. A. Ziparo, D. Calisi, G. Grisetti, J. Serafin, M. Prosmans, L. Van Gool, B. Leibe, M. Di Stefano, L. Petti, W. Burgard, F. Nenci, I. Bogoslavskyi, O. Vysotska, M. Bennewitz, and C. Stachniss. A user perspective on the rovina project. In *Proc. of the 18th ICOMOS General Assembly and Scientific Symposium "Heritage and Landscape as Human Values"*, pages 578–582. Florence, Italy, 2014.

[9] J. Serafin and G. Grisetti. Using augmented measurements to improve the convergence of icp. In *Proc. of the Int. Conf. on Simulation, Modeling and Programming for Autonomous Robots (SIMPAR)*, pages 566–577, Bergamo, Italy, 2014. Springer.

[10] V. Ziparo, M. Zaratti, G. Grisetti, T. Bonanni, J. Serafin, M. Di Cicco, M. Proesmans, L. Van Gool, O. Vysotska, I. Bogoslavskyi, and C. Stachniss. Exploration and mapping of catacombs with mobile robots. In *IEEE Int. Symposium on Safety, Security, and Rescue Robotics (SSRR)*, pages 1–2, Linköping, Sweden, 2013.

[11] J. Serafin. On-line dense visual odometry with depth images using normals based error functions. Master's thesis, Department of Computer, Control, and Management Engineering "Antonio Ruberti" at Sapienza University of Rome, Rome, Italy, 2013.

[12] I. Bogoslavskyi, O. Vysotska, J. Serafin, G. Grisetti, and C. Stachniss. Efficient traversability analysis for mobile robots using the kinect sensor. In *Proc. of the European Conference on Mobile Robots (ECMR)*, pages 158–163, Barcelona, Spain, 2013.

International Events

2015 **Volunteer, RSS-2015**, *Robotics: Science and Systems Conference*, Rome, Italy.

2014 **Participant, RoCKIn 2014**, *RoCKIn@Work Challenge*, Toulouse, France.
Member of the SPQR team, Sapienza University of Rome.

2014 **Presenter, SIMPAR-2014**, *Int. Conf. on Simulation, Modeling and Programming for Autonomous Robots*, Bergamo, Italy.

2014 **Participant, RoCKIn Camp 2014**, *RoCKIn@Work Challenge*, Rome, Italy.
Member of the SPQR team, Sapienza University of Rome.

International Projects

2013–2016 **European Project, ROVINA**, *Robots for Exploration, Digital Preservation and Visualization of Archeological Sites*, FP7-600890-ROVINA, `http://www.rovina-project.eu`.
Role and expertise: 3D Mapping.

Awards and Fellowships

2014 **1st Place, Computer Vision track**, *RoCKIn Camp 2014, RoCKIn@Work Challenge*, Rome, Italy.
Member of the SPQR team, Sapienza University of Rome.

2013 **Three Years Ph.D. Fellowship**, *Sapienza University of Rome*, Rome, Italy.

References

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and Management Engineering
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Jacopo Serafin