

Jacopo Serafin

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Curriculum Vitae

Education & Work Experiences

- 2020–Today **Manager L5, Perception**, *Toyota Research Institute*, Ann Arbor, MI 48105, USA.
- 2017–2020 **Research Scientist L4, Perception**, *Toyota Research Institute*, Ann Arbor, MI 48105, USA.
- Aug 2015– **Research Scholar**, *University of Michigan*, Ann Arbor, MI 48109, USA.
- Feb 2016 Research focus: Autonomous Driving, SLAM, 3D Perception; Host: Prof. E. Olson, APRIL Robotics Lab.
- 2013–2017 **Ph.D. in Engineering in Computer Science**, *Sapienza University of Rome*, Rome, Italy.
Research fields: Mobile Robotics, Localization, Mapping, SLAM, 3D 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.

Certifications

- 2021 **Intro to Self-Driving Cars**, by *Sebastian Thrun*, Udacity, [Certificate].
- 2019 **Deep Learning**, by *Andrew Ng*, Coursera, [Certificate].

Skills & Accomplishments

Practical & Hands On

- Main developer of a factor graph based object tracking module that has been used in Toyota Research Institute's automated vehicles for multiple years
- One of the main contributors to the perception and SLAM software of the European Project ROVINA (Robots for Exploration, Digital Preservation and Visualization of Archeological Sites)[website]
- Main developer for NICEP, a C++ open source library advancing the state of the art for 3D point cloud registration [website][github]
- Very good experience and daily use of C/C++
- Some experience (no daily use) with Python (including Pytorch), OpenGL, Matlab and Bash
- Good experience with standard robotics libraries/tools: LCM, ROS, OpenCV, PCL
- Daily use of version control software such as GIT and SVN
- Daily use of Unix/Linux operating system

Management & Organization

- Contributed to make successful demonstrations throughout the years at Toyota Research Institute at which high/top executive members were present, including the most recent 2021 Olympic Demonstration
- Owner of several successful OKRs for the perception team at the Toyota Research Institute
- Owner of multiple successful cross team initiatives at the Toyota Research Institute
- Currently manager and coach of multiple people in the perception team at the Toyota Research Institute
- Currently technical lead for the tracking scrum at the Toyota Research Institute, in this role for multiple years now
- Contributed and coordinated important demonstrations for international projects for yearly reviews (i.e. ROVINA)

Teamwork

- Contributing member for multiple years of the object tracking team at the Toyota Research Institute
- Contributing visiting researcher for several months at the APRIL Robotics Lab. at University of Michigan
- Contributing member for several years to the European Project ROVINA, involving multiple Universities (Freiburg, Bonn, Rome) and other private companies
- Contributing member for several years at the Ro.Co.Co. Laboratory at Sapienza University of Rome

Communication

- Led every week for several years now the agile ceremonies for the tracking scrum (i.e. standups, planning, ...)
- Presented several times deep dives, future road maps/results updates to Toyota Research Institute's high management/executive stakeholders
- Presented research and project results at worldwide conferences, and international events
- Performed university teaching activities over multiple years (i.e. assistant) for robotics and base C programming classes

Scientific Activities

Research Interests Mobile Robotics, Field Robotics, Localization, Mapping, SLAM, 3D Robot Perception, Computer Vision, Object Tracking, State Estimation, Sensor Fusion, Deep Learning, Automated Driving.

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)*, 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, 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)*, 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. Bordonni, 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)*, 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 (SIMPARG)*, 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 & Projects

- 2016 **Presenter, IROS**, *Int. Conf. on Simulation, Modeling and Programming for Autonomous Robots*, Daejeon, Korea.
- 2014 **Presenter, SIMPAR**, *Int. Conf. on Simulation, Modeling and Programming for Autonomous Robots*, Bergamo, Italy.
- 2014 **Participant, RoCKIn**, *RoCKIn@Work Challenge*, Toulouse, France.
Member of the SPQR team, Sapienza University of Rome.
- 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 & 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

Prof. Giorgio Grisetti
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and Management Engineering
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