

C u r r i c u l u m V i t a e S t e f a n o R o s a

University of Oxford, Department of Computer Science

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Qualification Summary

Research and working experience in estimation and optimization for autonomous navigation of mobile robots (SLAM, multi-robot localization, path planning, task allocation), artificial intelligence for human-robot cooperation, computer vision, human-machine interaction, assistive technologies.

Education

Jan. 2011 to Apr. 2014: Ph.D. in Mechatronics

Institution: IIT Istituto Italiano di Tecnologia, Genova, Italy and
Politecnico di Torino, Turin, Italy

Dissertation: Localization and Mapping for Service Robotics Applications

Sep. 2005 to Jan. 2008: M.Eng. in Computer Engineering

Institution: Politecnico di Torino, Turin, Italy

Sep. 2002 to Sep. 2005: B.Eng. in Computer Engineering

Institution: Politecnico di Torino, Turin, Italy

Employment

Oct. 2016 to Jan 2020: PostDoc Researcher, Senior Researcher

Institution: University of Oxford

Topics: Learning intuitive physics for human-robot interaction and navigation. Long-term localization and navigation of robots and people in GPS denied environments using fusion of visual and non-visual opportunistic signals. Using robot navigation experiences to assist in human localization and navigation, and vice versa with cross-modality training.

Projects:

- ESPRC programme grant "Mobile Robotics: Enabling a Pervasive Technology of the Future" (EP/M019918/1) in collaboration with Oxford Robotics Institute
- DementiaUK Deep and Frequent Phenotyping (DFP)
- InnovateUK (in collaboration with Navenio Ltd)

Jan. 2012 to 2016: Research fellow

Institution: Politecnico di Torino - Telecom Italia Joint Open Lab, Turin, Italy

Topics: Robust Simultaneous Localization And Mapping (SLAM) for industrial service robotics, visual-based localization, object detection and pose estimation for pick and place

Projects:

- HOTBOT, an autonomous mobile robot for data center hotspot detection
- FLY4SMARTCITY, a cloud-robotics service in a smart city scenario for emergency management using small Unmanned Aerial Vehicles (UAVs)
- VIRGIL, a tele-presence museum tour-guide robot
- PARLOMA, a low-cost robotic hand for remote communication between deaf-blind users

Jan. 2011 to Apr. 2014: Ph.D. student in Mechatronics

Institution: Istituto Italiano di Tecnologia, Genova, Italy and Politecnico di Torino, Turin, Italy

Topics: Laser-based long-term localization and SLAM for service robotics; 3D computer vision algorithms for space robotics applications

Projects:

- Development of a system for astronaut's body mass estimation using a vision sensor in microgravity environments
- Space debris detection using wide-baseline stereo cameras

Jan. 2008 to Dec. 2010: Research fellow

Institution: Politecnico di Torino, Turin, Italy

Topics: Design and implementation of algorithms for mobile robot localization, sensor fusion, vision-based SLAM, Wi-Fi based communication, path-planning and video surveillance

Projects:

- MACp4LOG: a mobile robotic platform, with on-board vision systems and sensors, integrating a flexible wireless communication solution, for monitoring and surveillance in logistic environments

May. 2005 to Dec. 2005: Java developer

Company: E-Mentor S.r.L.

Project:

- Development of graphical user interfaces for e-learning platforms and development of a role playing game for e-learning

Professional Activities

Speaker: Approcci innovativi e applicazioni della visione artificiale, Aosta, November, 2010; EuroScience Open Forum - ESOF, Turin, July, 2010; invited speaker at StrongMar Winter School, Edinburgh, 2018

Reviewer for int. journals and conferences: Transactions on Robotics T-RO, Transactions on Industrial Informatics TII, Journal of Intelligent & Robotic Systems; Intelligent Service Robotics; International Conference on Robotics and Automation - ICRA; International Conference on Intelligent RObots and Systems - IROS; Conference on Decision and Control - CDC

Co-Founder: Hotblack Robotics, 2016 (Open-Source Cloud Robotics solutions), EWavee, 2013, Wi-Fi localization services

Teaching

Assistant lecturer for Automatic Control, Politecnico di Torino, 2013;
Basics of Automatic Control, Politecnico di Torino, 2012; Robotics, Politecnico di Torino, 2013-2015

Lecturer for Ph.D. course: Research topics in computer and control engineering - Introduction to probabilistic robotics, Politecnico di Torino, 2010-2012

Awards

National Award for Innovation - Premio Perotto Zucca
Startup Weekend Turin 2013 - Mind the Bridge grant

Languages

English: fluent (speaking, reading, writing), IELTS; **French:** basic

Publications

Journal papers

1. Yang B., Rosa S., Markham A., Trigoni N., Wen H., **Dense 3D Object Reconstruction from a Single Depth View**, Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2018, DOI: 10.1109/TPAMI.2018.2868195
2. Rosa S., Patane' A., Lu X., Trigoni N., **Semantic Place Understanding for Human-Robot Coexistence - Towards Intelligent Workplaces**, Transactions on Human-Machine Systems (THMS), 2018, DOI: 10.1109/THMS.2018.2875079
3. Rosa S., Toscana G., Bona B. **Q-PSO: Fast Quaternion-based Pose Estimation From RGB-D Images**, Journal of Intelligent and Robotic Systems, 2017, DOI: 10.1007/s10846-017-0714-3
4. Anjum M.L., Rosa S., Bona B. **Tracking a subset of skeleton joints - An effective approach towards complex human activity recognition**, Journal of Robotics, vol. 2017, DOI:10.1155/2017/7610417

5. Russo L.O., Rosa S., Maggiora M., Bona B. **A Novel Cloud Based Service Robotics Application to Data Center Environmental Monitoring**, Sensors, 2016, DOI: 10.3390/s16081255
6. Russo L.O., Farulla G., Pianu D., Salgarella A., Controzzi M., Cipriani C., Oddo C., Geraci C., Rosa S., Indaco M., **PARLOMA - a remote communication system for deafblind persons by means of gesture recognition**, International Journal of Advanced Robotic Systems, 2015, ISSN: 1729-8806, DOI: 10.5772/60416
7. Ermacora G., Rosa S., Toma A., **Fly4SmartCity: a Cloud Robotics Service for Smart City Applications**, Journal of Ambient Intelligence and Smart Environments, 2016, DOI: 10.3233/AIS-160374
8. Bona B., Carlone L., Indri M., Rosa S., **Supervision and monitoring of logistic spaces by a cooperative robotic team: methodologies, problems, and solutions**, Intelligent Service Robotics, 2014, DOI: 10.1007/s11370-014-0151-0
9. Abrate F., Bona B., Indri M., Rosa S., Tibaldi F., **Multirobot Localization in Highly Symmetric Environments**, Journal of Intelligent and Robotic Systems, 2013, DOI: 10.1007/s10846-012-9790-6
10. Abrate F., Bona B., Indri M., Rosa S., Tibaldi F., **Multi-robot map updating in dynamic environments**, in Springer Tracts in Advanced Robotics, Volume 83, 2013, DOI: 10.1007/978-3-642-32723-0

Conference papers

1. Hu Q., Yang B., Xie L., Rosa S., Guo Y., Wang Z., Trigoni N., Markham A., **RandLA-Net: Efficient Semantic Segmentation of Large-Scale Point Clouds**, accepted - oral, Conference on Computer Vision and Pattern Recognition (CVPR) 2020
2. Saputra R.U., B. de Gusmao P.B., Lu X., Almalioglu Y., Rosa S., Chen C., Wahlstrom W., Wang W., Markham A., Trigoni N., **Deeptio: A deep thermal-inertial odometry with visual hallucination**, accepted, ICRA 2020
3. Lu X., Rosa S., Zhao P., Wang B., Chen C., Stankovic J., Trigoni N., Markham A., **See Through Smoke: Robust Indoor Mapping with Low-cost mmWave Radar**, accepted, Mobisys 2020
4. Chen C., Rosa S., Miao Y., Lu X., Wu W., Markham A., Trigoni N., **Selective Sensor Fusion for Neural Visual Inertial Odometry**, Conference on Computer Vision and Pattern Recognition (CVPR), Long Beach, 2019

5. Rosa S.*, Wang Z.*, Markham A., **Learning the Intuitive Physics of Non-Rigid Object Deformations**, NeurIPS Workshop: Modeling the Physical World: Perception, Learning, and Control, Montreal, 2018
6. Rosa S., Patanè A., Lu X., Trigoni N., **CommonSense: Collaborative Learning of Scene Semantics by Robots and Humans**, IoPARTS workshop, ACM MobySys 2018, Munich, DE
7. Wang Z.*, Rosa S.*, Wei B., Wang S., Markham A., Trigoni N., **3D-PhysNet: Learning the Intuitive Physics of Non-Rigid Object Deformations**, IJCAI 2018, Stockholm, SWE
8. Rosa S.*, Wang Z.*, Yang B., Linhai X., Wang S., Markham A., Trigoni N., **Defo-Net: Learning Body Deformation using Generative Adversarial Networks**, ICRA 2018, Brisbane, AU
9. Linhai X., Wang S., Rosa S., Trigoni N., **Learning with Training Wheels: Speeding up Training with a Simple Controller for Deep Reinforcement Learning**, ICRA 2018, Brisbane, AU
10. Lu X., Kan X., Rosa S., Wen H., Markham A., Trigoni N., **Towards Self-supervised Face Labeling via Cross-modality Association**, poster, SenSys 2017, Amsterdam, NL
11. Rosa S., Lu X., Wen H., Trigoni N., **Leveraging User Activities and Mobile Robots for Semantic Mapping and User Localization**. HRI 2017 Late Breaking Reports, Vienna
12. Rosa S., Toscana G. **Fast Feature-Less Quaternion-based Particle Swarm Optimization for Rigid and Articulated Pose Estimation From RGB-D Images**, R6D2016 Workshop, ECCV 2016, Amsterdam, NL
13. Toscana G., Rosa S., **Fast Feature-Less Quaternion-based Particle Swarm Optimization for Object Pose Estimation From RGB-D Images**, BMVC 2016, York, UK
14. Rosa S., Toscana G., **Fast Graph-Based Object Segmentation for RGB-D Images**, Intellisys 2016, London, UK
15. Rosa S., Russo L.O., Toscana G., Primatesta S., Kaouk Ng M., Bona B., **Leveraging the Cloud for Connected Service Robotics Applications**, Workshop on Robotics and Technology Transfer, ETFA 2015, Luxemburg, LU
16. B. de Gusmao P.B., Rosa S., Magli E., Lepsøy S., Francini L., **Robotics Navigation Using MPEG CDVS**, 17th International Workshop on Multimedia Signal Processing, MMSP 2015, Xiamen, China
17. Rosa S., Russo L.O., Bona B., **Towards A ROS-Based Autonomous Cloud Robotics Platform for Data Center Monitoring**. In: the 19th IEEE International

- Conference on Emerging Technologies and Factory Automation (ETF A),
Barcelona, Spain, 2014
18. Lupetti M.L., Rosa S., Ermacora G., **From a Robotic Vacuum Cleaner to Robot Companion: Acceptance and Engagement in Domestic Environments**. HRI 2015 Late breaking reports, Christchurch NZ
 19. Ermacora G., Toma A., Rosa S., Antonini R., **A cloud based service for management and planning of autonomous UAV missions in smartcity scenario**. MESAS-14, May 5 - 6, 2014, Roma, Italy
 20. Ermacora G., Toma A., Rosa S., Antonini R., **Leveraging open data for supporting a cloud robotics service in a smart city environment**. IAS-13, July 15 - 19, 2014, Padova, Italy
 21. Rosa S., Russo L.O., Airò Farulla G., Antonini R., Gaspardone M., Carlone L., Bona B., **An Application of Laser-Based Autonomous Navigation for Data-Center Monitoring**. IAS-13, July 15 - 19, 2014, Padova, Italy
 22. Yuan Z., Rosa S., Russo L.O., Bona B., **A Kinect-based Front-end for Graph-SLAM Using Plane Matching in Planar Indoor Environments**. IAS-13, July 15 - 19, 2014, Padova, Italy
 23. Anjum M., Ahmad O., Rosa S., Yin J., Bona B., **Skeleton Tracking Based Complex Human Activity Recognition Using Kinect Camera**. In: Social Robotics / Beetz, Springer International Publishing, pp. 23-33. ISBN 9783319119724
 24. Airo Farulla G., Russo L.O., Pintor C., Pianu D., Micotti G., Salgarella A.R., Camboni D., Controzzi M., Cipriani C., Oddo C.M., Rosa S., Indaco M., **Real-time single camera hand gesture recognition system for remote deaf-blind communication**. In: 1st International Conference on Augmented and Virtual Reality, Lecce, 17-20 September 2014.
 25. Yin J., Carlone L., Rosa S., Anjum M.L., Bona B., **Scan Matching for Graph SLAM in Indoor Dynamic Scenarios**, 27th International FLAIRS Conference, May 21 - 23, 2014, Pensacola Beach, Florida, USA
 26. Russo L.O., Rosa S., Matteucci M., Bona B., **A ROS Implementation of the Mono-SLAM Algorithm**, International Conference on Artificial Intelligence & Applications (ARIA-2014), 2014
 27. Russo L.O., Airò farulla G., Indaco M., Rosa S., Rolfo D., Bona B., **Blurring prediction in Monocular SLAM**, 8th IEEE International Design & Test Symposium 2013 (IDT), 2013
 28. L. Carlone, J. Yin, S. Rosa, Z. Yuan, **Graph optimization with unstructured covariance: fast, accurate, linear approximation**. In: Simulation, Modeling, and Programming for Autonomous Robots (SIMP AR 2012), 2012.

29. Rosa S., Paleari M., Ariano P., Bona B., **Object Tracking with Adaptive HOG Detector and Adaptive Rao-Blackwellised Particle Filter**. In: SPIE 8301, Intelligent Robots and Computer Vision XXIX: Algorithms and Techniques, 2012.
30. Paleari M., Margaria V., Rosa S., Ariano P., **HExEC: hand exoskeleton electromyographic control**, 4th International Workshop on Human-Friendly Robotics (HFR 2011), University of Twente, The Netherlands
31. Macchia V.; Rosa S; Carlone L; Bona B., **An Application of Omnidirectional Vision to Grid-based SLAM in Indoor Environments**. In: Workshop on Omnidirectional Robot Vision, International Conference on Robotics and Automation (ICRA 2010), 2010.
32. Abrate F; Bona B; Indri M; Rosa S.; Tibaldi F., **Map updating in dynamic environments**. In: ISR/ROBOTIK 2010
33. Brevi D., Fileppo F. , Scopigno R. , Abrate F, Bona B., Rosa S., Tibaldi F., **Hybrid localization solutions for robotic logistic applications**. In: Technologies for Practical Robot Applications (TePRA), 2009.
34. Abrate F; Bona B.; Indri M; Rosa S; Tibaldi F., **Three-State Multirobot Collaborative Localization in Symmetrical Environments**. In: ROBOTICA 2009
35. Abrate F; Bona B; Indri M.; Rosa S; Tibaldi F., **Switching Multirobot Collaborative Localization in Symmetrical Environments**. In: IROS 2008 2nd Workshop on Planning, Perception and Navigation for Intelligent Vehicles, 2008.

Links

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