Luigi Palmieri

Curriculum Vitae

* *April 2, 1986, Aversa, Italy*
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Research Interests

Kinodynamic motion planning in densely crowded and dynamic environments, control of non linear dynamic systems, learning of and kinodynamic motion planning with socially normative behaviors, human-robot interaction

Education

Since 2013 **PhD candidate, Social Robotics Laboratory**, *Albert-Ludwigs-Universität Freiburg*, Freiburg, Germany, advisor Dr. Kai O. Arras.

2009–2012 **MSc Computer Science and Engineering**, *Seconda Università degli Studi di Napoli*, Naples, Italy.

Specialization: control theory, automation and robotics

Master's thesis: *A behavioural approach to obstacle avoidance for mobile manipulators based on distributed sensing*, advisor Prof. Ciro Natale

Grade: 110/110 *cum laude*

2006–2009 **BSc Computer Science and Engineering**, *Seconda Università degli Studi di Napoli*, Naples, Italy.

Specialization: control theory, automation and robotics

Bachelor's thesis: *Digitalizzazione e linearizzazione di un sensore mediante microcontrollore* (sensor's digitalization and linearization via a microcontroller), advisor Prof. Giuseppe De Maria

Grade: 110/110

Professional Experience

Since 2016 **Motion planning research engineer**, *Robert Bosch GmbH, Corporate Research*, Renningen, Stuttgart, Germany.

2013–2016 **Researcher**, *Social Robotics Laboratory, Albert-Ludwigs-Universität Freiburg*, Freiburg, Germany.

2012–2013 **Research engineer**, *SESM – Selex ES, Leonardo Group*, Giugliano, Italy.
Developing innovative detection and tracking solutions for indoor short range radars.

2011–2012 **Internship**, *Automatic Control Laboratory, Seconda Università degli Studi di Napoli*, Aversa, Italy.
Development of a dynamical simulator of the Kuka Youbot robot

Involvement in Funded Research Projects

Since 2017 **EU project ILIAD**, *as member of Robert Bosch GmbH, Corporate Research*, Renningen, Stuttgart, Germany.
Responsible for the research activities in the area of motion planning

2013–2016 **EU project SPENCER**, *as member of the Social Robotics Laboratory, Albert-Ludwigs-Universität Freiburg*, Freiburg, Germany.
Responsible for the research activities in the area of motion planning

2012–2013 **POR FSE Embedded Systems in Critical Domains**, *as member of SESM – Selex ES, Leonardo Group*, Giugliano, Italy.
Developing innovative detection and tracking solutions for indoor short range radars

2011–2012 **EU project SAPHARI**, *as member of Automatic Control Laboratory, Seconda Università degli Studi di Napoli*, Aversa, Italy.
Contribution to the low-level reactive obstacle avoidance approach developed by the Seconda Università degli Studi di Napoli, during an internship and the Master thesis

Academic Activities

Member of IEEE RAS Technical Committee *Algorithms for Planning and Control of Robot Motion*

Reviewer for: IEEE RAS Transactions on Robotics, IEEE International Conference on Intelligent Robots and Systems, IEEE International Conference on Robotics and Automation, IEEE Robotics and Automation Letters

Program Committee of the workshop *Introspective Methods for Reliable Autonomy* at IROS 2017

Teaching

2015 ***Social Robotics* seminar**, *Albert-Ludwigs-Universität Freiburg*.
Tutor

2013–2015 **Graduate lecture *Human-oriented robotics***, *Albert-Ludwigs-Universität Freiburg*.
Tutor for lecture and laboratory

Graduate and undergraduate students tutoring

2016–2017 Supervisor for the MSc thesis *"Predictive planning in human environments"*, A. Rudenko, Albert-Ludwigs-Universität Freiburg

2015–2016 Supervisor for the MSc Praktikum *"A randomized approach to find homotopy classes"*, A. Rudenko, Albert-Ludwigs-Universität Freiburg

2015–2016 Supervisor for the MSc project *"A randomized approach to find homotopy classes"*, A. Rudenko, Albert-Ludwigs-Universität Freiburg

2015 Supervisor for the MSc thesis *"Human-aware robot navigation in dynamic environments"*, M. De Mauri, Albert-Ludwigs-Universität Freiburg

2015 Supervisor of MSc HiWi project, *"Single query sampling based motion planners efficiency in dynamic environments"*, M. De Mauri, Albert-Ludwigs-Universität Freiburg

2015 Supervisor for the MSc HiWi project *"Using smoothing splines to improve quality of RRT paths"*, A. Rudenko, Albert-Ludwigs-Universität Freiburg

2015 Supervisor for the MSc Praktikum *"Finding and exploiting homotopy classes in robot navigation"*, B. Mirchevska, Albert-Ludwigs-Universität Freiburg

2014 Supervisor for the MSc HiWi project *"Evaluation of head pose estimation ROS packages"*, H. D. Mendoza, Albert-Ludwigs-Universität Freiburg

2013–2014 Supervisor for the MSc project *"Simulation of group dynamics for behavior modelling in robot navigation"*, S. Wehner, Albert-Ludwigs-Universität Freiburg

Peer-Reviewed Publications

Journals

L. Palmieri, A. Rudenko and K.O. Arras, "A Fast Random Walk Approach To Find Diverse Paths for Robot Navigation", 2017 IEEE Robotics and Automation Letters.

Conferences

H. Banzhaf, L. Palmieri, D. Nienhueser, T. Schamm, S. Knoop, and J. Marius Zoellner, "Hybrid Curvature Steer: A Novel Extend Function for Sampling-Based Nonholonomic Motion Planning in Tight Environments", *Proc. of IEEE 20th International Conference on Intelligent Transportation Systems*, Yokohama, Japan, 2017.

L. Palmieri, T.P. Kucner, M. Magnusson, A. Lilienthal and K.O. Arras,"Kinodynamic Motion Planning on Gaussian Mixture Fields", *Proc. of IEEE/RSJ Int. Conference on Robotics and Automation (ICRA)*, Singapore, 2017.

L. Palmieri, S. Koenig and K.O Arras, "RRT-Based Nonholonomic Motion Planning Using Any-Angle Path Biasing", *Proc. of IEEE/RSJ Int. Conference on Robotics and Automation (ICRA)*, Stockholm, Sweden, 2016.

Triebel, R.; Arras, K.O. *et al*, "SPENCER: A Socially Aware Service Robot for Passenger Guidance and Help in Busy Airports", *Proc. of Field and Service Robotics (FSR) conference*, Toronto, Canada, 2015.

L. Palmieri, K.O. Arras, "Distance Metric Learning for RRT-Based Motion Planning with Constant-Time Inference", *Proc. of IEEE/RSJ Int. Conference on Robotics and Automation (ICRA)*, Seattle, USA, 2015.

L. Palmieri, K.O. Arras, "A Novel RRT Extend Function for Efficient and Smooth Mobile Robot Motion Planning", *Proc. of IEEE/RSJ Int. Conference on Intelligent Robots and Systems (IROS)*, Chicago, USA, 2014.

A. Buonanno, M. D'Urso, L. Palmieri, "WiFi-based Passive Bistatic Radar by using Moving Target Indicator and Least Square Adaptive Filtering", *Proc. of IEEE/RSJ Int. Symposium on Phased Array Systems and Technology*, Boston, USA, 2013 .

Workshops

A. Rudenko, L. Palmieri, K.O. Arras, "Predictive Planning for a Mobile Robot in Human Environments", *Proc. of Workshop on AI Planning and Robotics: Challenges and Methods*, IEEE International Conference on Robotics and Automation, Singapore, 2017.

L. Palmieri, S. Koenig, K.O. Arras, "RRT-Based Nonholonomic Motion Planning Using Any-Angle Path Biasing", *Proc. of Symposium on Combinatorial Search*, Tarrytown, NY, USA, 2016.

B. Okal, T. Linder, L. Palmieri, K.O. Arras, "A Socially Aware Passenger Guidance Robot: Tracking, Learning, Planning", *Proc. of the Workshop on Social Norms in Robotics and HRI (IROS)*, Hamburg, Germany, 2015.

L. Palmieri, A. Rudenko, K.O. Arras, "A Fast Randomized Method to Find Homotopy Classes for Socially-Aware Navigation", *Proc. of the 4th Workshop on Assistance and Service Robotics in a Human Environment (IROS)*, Hamburg, Germany, 2015.

L. Palmieri, K.O. Arras, "Efficient and Smooth RRT Motion Planning Using a Novel Extend Function for Wheeled Mobile Robots", *Proc. of the 2nd Workshop on Planning and Robotics, International Conference on Automated Planning and Scheduling (ICAPS)*, Portsmouth, USA, 2014.

L. Palmieri, K.O. Arras, "Distance Metric Learning for RRT-Based Motion Planning for Wheeled Mobile Robots", *Proc. of Machine Learning in Planning and Control of Robot Motion Workshop, IEEE/RSJ Int. Conference on Intelligent Robots and Systems (IROS)*, Chicago, USA, 2014.

Open Source Software Projects

Main Developer for

srl_global_planner, a ROS move-base plug-in with several sampling-based motion planners

srl_rhcf_planner, a ROS move-base plug-in that implements the randomized homotopy class finder

POSQ, a steering function for differential drive robots

srl_dstar_planner, a ROS move-base plug-in that contains a D* Lite implementation with a post-smoothing algorithm

srl_eband_local_planner, a ROS move-base base_local_planner plug-in, that implements the elastic band approach for differential drive robots