RICCARDO POLVARA

Name	Riccardo
Surname	Polvara
Address	Plymouth, Devon, UK
Website	http://pulver22.github.io
GitHub	https://github.com/pulver22
Date of birth	22 September 1991
Nationality	Italian
Sex	Male

Profile

Mobile roboticist specialised in path planning for autonomous system. A background in Computer Engineering, artificial intelligence and robotics. Experience working abroad in a multicultural environment. Strong motivation for developing intelligent systems.

Education

2015-present PhD student in Mobile Robotics. Plymouth University, School of Marine Science and Engineering. Plymouth, United Kingdom.
In "An Intelligent Integrated Marine Observation System" a flying robot is used to increase the overall awareness of the environment in which an autonomous vessel is traversing.
Supervisors: Sanjay Sharma, Robert Sutton, Jian Wan, Andrew Manning

2013-2015 MEng in "Computer Engineering". Politecnico di Milano. Milano, Italy.
Advanced preparation in: classic and cognitive robotics, reinforcement learning, soft computing, artificial intelligence, multi-agent systems.
Dissertation title: "A Next-Best-Smell Approach for Remote Gas Detection with a Mobile Robot"
Supervisors: Francesco Amigoni, Erik Schaffernicht

2010-2013 BEng in "Computer Engineering". Politecnico di Milano. Milano, Italy.
Advanced preparation in: application development, databases, theoretical computer science, IT system architecture, electronics, telecommunication.
Dissertation title: HorseFever – Implementing in Java a card based game focusing on different design pattern and testing aspects.
Supervisor: Raffaela Mirandola

2005-2010 High School, "Liceo Scientifico, Piano Nazionale di Informatica" (Scientific Course, National Plan of Computer Science). Oggiono, Italy.
It gives entry to university. Main subjects: computer science, mathematics, physics, biology, English, Latin.

Work/Research Experience

2015 - present Teaching assistant and demonstrator. Plymouth University. United Kingdom. I prepared and presented the material for individual lessons on Robotics. Moreover I followed students during the practical sessions of the following courses:
MECH533 Robotics and Controller
MECH118 Basic Electrical Principles

2015 Placement, Centre for Applied Autonomous Sensor Systems, Örebro University, Sweden.
I developed an on-line path planning algorithm for gas mapping with a mobile robot equipped with a remote gas sensor. The path is calculated by combining the utility values over a set of multiple criteria, exploiting the concepts of Multi Criteria Decision Making (MCDM) and Choquet Fuzzy Integral in order to generate a single global utility value for each candidate location, and thus selecting the best one. During this experience I faced real problem such as mapping, localization, navigation and data sensor integration. I learn how to use ROS (Robot Operating System) and the Gazebo simulator, and I had the opportunity to use two real platforms such as the Turtlebot and the Husky A200, both produced by Clearpath Robotics.
https://www.oru.se/aass

2014-2015 Tutor, First Lego League. Monza, Italy.
My duties involved supervising children in building a robot using the Mindstorm Lego platform and solving the challenges required by the competition.
http://www.firstlegoleague.org

2013-2015 Reporter, Basketinside.com. Cantù, Italy.
Responsible of writing articles about the basketball matches played by Pallacanestro Cantù in Serie A Beko and EuroCup championships.
http://www.basketinside.com

Technical Skills

Robotics	- I developed libraries for the path planning of two mobile wheel-equipped robots (Clearpath Turtlebot and Husky A200) and the Parrot ARDrone unmanned aerial vehicle - Experience with some of the most important software tools for Robotics: ROS and Gazebo. - Hands-on experience with LIDAR and TDLAS gas sensor.
Computer Science	- Advanced knowledge of Unix OS (Shell, Bash scripting, SSH) and related tools (gcc, g++, make, vi, git, etc). - Proficiency in C/C++ - Familiarity with several programming languages (Java/Java EE, Python, HTML, JavaScript, XML, Assembly x86 and Latex) and tools for debug (gdb, valgrind), software design (UML) and documentation (Doxygen). - Familiarity with SQL for database management. - Familiarity with parallel computing (openMP, openMPI, CUDA, HADOOP). - Familiarity with the statistical software Matlab for data analysis.

Languages

Italian:	Mother tongue
English:	Fluent
German:	Beginner

Certifications

03-2016	Machine Learning by Stanford University on Coursera. https://www.coursera.org/account/accomplishments/records/GPAU3NLRSEZN
04-2013	TOEIC (Test of English for International Communication): 720-990
06-2008	ECDL (European Computer Driving License)
06-2004	Goethe-Zertifikat A2: Start Deutsch 2

Awards, Fellowships and Scholarships

2017	Associate Fellow of The Higher Education Academy in recognition of attainment against theUK Professional Standards Framework for teaching and learning support in higher education.
2016	Travel grant for attending a summer school about heterogeneity in multi-agents robotics system organised by the FP7 EU project TRADR and H2020 ERL Emergency.
2015-present	Scholarship, project “An Intelligent Integrated Marine System”. Funded by School of Marine Science and Engineering, Plymouth University, England.

Talks, Conferences, Workshops, Media

2015- present	(Reviewer) I have been the reviewer for different conferences and journal: ICRA(International Conference on Robotics and Automation), ICTAI (International Conference on Tools with Artificial Intelligence), CLAWAR (International Conference on Climbing and Walking Robots and Support Technologies for Mobile Machines), IFAC (International Federation of Automatic Control) World Congress, ISOPE (International Society of Offshore and Polar Engineers), Internation Journal of Control, Journal of Navigation.
08-2016	(Participant) ERL Emergency/TRADR Summer school on heterogeneity in Robotic Systems

Publications

Journal papers

- **Polvara R**, Sharma S, Wan J, Manning A, Sutton R (2017). Obstacle Avoidance Approaches for Autonomous Navigation of Unmanned Surface Vehicles. *Journal of Navigation*. 1-16
- **Polvara* R**., Patacchiola* M., Sharma, S., Wan J., Manning, A., Sutton R., Cangelosi, A. (under review). "Autonomous Quadrotor Landing using Deep Reinforcement Learning". *Co-first authors, https://arxiv.org/abs/1709.03339

Conference Papers

- Abed W, **Polvara R**, Singh Y, Sharma S, Sutton R, Hatton D, Manning A, Wan Y (2016). Advanced feature extraction and dimensionality reduction for unmanned underwater vehicle fault diagnosis. *UKACC 11th International Conference on Control (CONTROL)*, Belfast, UK, pp. 1-6. doi: 10.1109/CONTROL.2016.7737596

- **Polvara R**, Sharma S, Sutton R, Wan J, Manning A (2016). Toward a Multi-agent system for Marine Observation. *Advances in Cooperative Robotics: Proceedings of the 19th International Conference on (CLAWAR)*, London, UK, pp. 225-232. doi: 10.1142/9789813149137_0028

- Singh Y, **Polvara R**, Sharma S, Hatton D, Wan J, Sutton R (2016). Design of a Variable Buoyancy Engine for Small Scale Underwater Vehicle. *International Conference on Advances in Subsea Engineering, Structures and Systems (ASESS-2016)*, Glasgow, UK.

- **Polvara R**, Sharma S, Wan J, Manning A, Sutton R (2017). Towards autonomous landing on a moving vessel through fiducial markers. *IEEE European Conference on Mobile Robotics (ECMR)*, Paris, France.

- T Szyrowski, Bogdan, P., Khan, A., Pemberton, R., Sharma, S.K., Singh, Y., **Polvara, R**. Range Extension for Electromagnetic Detection of Subsea Power and Telecommunication Cables.*International Conference on Marine Electromagnetics (MARELEC 2017)*, 27 June-30 June, 2017, Liverpool, UK.

Presentation and Others

- **Polvara R**, Sharma S, Sutton R, Wan J, Manning A (2016). Toward an Air-Sea Cooperation System for Marine Observation. *UK Robotics Week*, Plymouth, UK.
- Terzakis G, **Polvara R**, Sharma S, Sutton R (uder review). Monocular Visual Odometry for an Unmanned Sea-Surface Vehicle. *https://arxiv.org/abs/1707.04444*