

# Alberto Quattrini Li

## *Curriculum Vitae*

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## PROFESSIONAL EXPERIENCE

- 07/2018 – Present** Assistant Professor, Computer Science Department, Dartmouth College (Hanover NH, USA).
- 08/2016 – 07/2018** Research Assistant Professor, Computer Science and Engineering Department, University of South Carolina (Columbia SC, USA).
- 06/2015 – 08/2016** Postdoctoral fellow at Autonomous Field Robotics Lab, Computer Science and Engineering Department, University of South Carolina (Columbia SC, USA).  
Advisor: Prof. Ioannis Rekleitis
- 02/2014 – 08/2014** Visiting Ph.D. student at Robotic Sensor Networks Lab, Department of Computer Science and Engineering, University of Minnesota (Minneapolis MN, USA).  
Advisor: Prof. Volkan Isler
- 2012 – 2015** Ph.D. fellow in Computer Science and Engineering, Artificial Intelligence and Robotics Lab (AIRLab), Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano (Milan, Italy).  
Advisor: Prof. Francesco Amigoni
- 2012** Research assistant, Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano (Milan, Italy).  
Project: “PoliSpell: An Adaptive Spellchecker and Predictor for People with Dyslexia”  
Advisor: Prof. Licia Sbattella

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## EDUCATION

- 2012 – 2015** Ph.D. in Computer Science and Engineering (with highest honors), Politecnico di Milano (Milan, Italy).  
Thesis title: *Study, Design, and Evaluation of Exploration Strategies for Autonomous Mobile Robots*,  
Advisor: Prof. Francesco Amigoni
- 2009 – 2011** M.Sc. in Computer Science and Engineering (with highest honors), Politecnico di Milano (Milan, Italy) and Politecnico di Torino (Double degree).  
Thesis title: *Development of a Framework for Evaluating Performance of Exploration Strategies of Autonomous Robots*, Advisor: Prof. Francesco Amigoni
- 2006 – 2009**: B.Sc. in Computer Science and Engineering, Università di Pisa (Pisa, Italy).

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## SCHOLARSHIPS, HONORS, AND AWARDS

- 2020** Finalist for the Mario Gerla Award for Research in Computer Science 2020 (Winner TBD in December).

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- 2020** Best Demo award for “PolarTag: Invisible Data with Light Polarization” [C39], at the International Workshop on Mobile Computing Systems and Applications (HotMobile).
- 2020** Best paper award for “AmphiLight: Direct Air-Water Communication with Laser Light” [C45], at the USENIX Symposium on Networked Systems Design and Implementation (NSDI) 2020.
- 2019** Finalist for best application paper award for “SVIn2: An underwater SLAM system using sonar, visual, inertial, and depth sensor” [C32], at the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2019.
- 2019** ICRA workshop best paper award for the paper “On the mutual relation between SLAM and image enhancement in underwater environments” [C30], at the ICRA workshop on Underwater Robotics Perception, 2019.
- 2018** Dartmouth Walter and Constance Burke Research Initiation Award.
- 2017** Outstanding reviewer for “IEEE Journal of Oceanic Engineering”.
- 2013 – 2014** Scuola Interpolitecnica: complementary Ph.D. program for few top Ph.D. students among those of Politecnico di Milano, Politecnico di Torino, and Politecnico di Bari, Italy.
- 2012 – 2014** Scholarship from the Italian Ministry of Education, University, and Research, given to the top 10-15% of admitted Ph.D. students.
- 2009 – 2011** Alta Scuola Politecnica: complementary M.Sc. program for the top 150 M.Sc. students among Politecnico di Milano and Politecnico di Torino, Italy.

## FUNDING

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- 2020-2024** NSF Collaborative Research: NRI: INT: Cooperative Underwater Structure Inspection and Mapping. Dartmouth PI. Total funding  $\sim$ \$1.3M, with Rekleitis (lead), Nelakuditi, Mordohai, Casana.
- 2020-2021** Microsoft AI 4 Earth Innovation: Classification of problematic cyanobacterial taxa in freshwater lakes using big data and robotics technology. PI, Total funding (cloud service credit) \$15k, with Cottingham and Subrahmanian.
- 2019-2022** NSF MRI: Acq. of marine multirobot systems for underwater monitoring and construction – PI. Total funding \$400k, with Balkcom, Casana, Zhou, Zhu.
- 2019-2023** RII Track-2 FEC: Computational Methods and Autonomous Robotics Systems for Modeling and Predicting Harmful Cyanobacterial Blooms – PI. Total funding \$2.9M, renewable to \$5.9M.
- 2019** AWS RoboMaker gift: 21 Husarion ROSbot 2.0 mobile robots. Total value:  $\sim$ \$27,300.

## RESEARCH INTERESTS

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**Keywords:** Ground and Marine Robotics, Multi-Robot Systems, Autonomous Mobile Robotics, Cooperative Robots, Active Perception, On-line Decision Making, Navigation Strategies, Coordination Methods, Environmental Monitoring, Search-based Optimization, Communication and Networking Constraints, Localization and Mapping, Sensor Fusion, Gaussian Processes, Machine Learning, Artificial Intelligence.

**A slightly longer story:** My research activity covers the fields of autonomous mobile robotics and multi-agent systems. In particular, I have mainly focused on the study, the development, and experimental assessment of techniques for autonomous decision-making in the exploration problem, where one or more robots are employed to discover features of environments—e.g., obstacles, water quality. I have looked at such a problem considering real practical constraints so that a multirobot system can be reliably deployed, such as communication constraints. Recently, I have also been interested in robot localization and mapping. Many of my contributions have been tested on ground and marine robots. The long-term goal is to develop ubiquitous collaborative multirobot systems operating in real world environments to enable applications, such as environmental monitoring and mapping, to produce a positive impact on the society.

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## PUBLICATIONS

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### JOURNAL PAPERS

- [J5] A. Quattrini Li, “Exploration and mapping with groups of robots: Recent trends,” *Current Robotics Reports*, pp. 1–11, 2020.
- [J4] A. Quattrini Li, P. K. Penumarthi, J. Banfi, N. Basilico, J. O’Kane, I. Rekleitis, S. Nelakuditi, and F. Amigoni, “Multi-robot online sensing strategies for the construction of communication maps,” *Autonomous Robots*, pp. 1–21, 2019.
- [J3] F. Amigoni and A. Quattrini Li, “Comparing methods for merging redundant line segments in maps,” *Robotics and Autonomous Systems*, vol. 99, pp. 135–147, 2018.
- [J2] J. Banfi, A. Quattrini Li, I. Rekleitis, F. Amigoni, and N. Basilico, “Strategies for coordinated multirobot exploration with recurrent connectivity constraints,” *Autonomous Robots*, vol. 42, pp. 875–894, 2018.
- [J1] A. Quattrini Li, R. Cipolleschi, M. Giusto, and F. Amigoni, “A semantically-informed multirobot system for exploration of relevant areas in search and rescue settings,” *Autonomous Robots*, vol. 40, no. 4, pp. 581–597, 2016.

### BOOK CHAPTERS

- [BC1] F. Amigoni, N. Basilico, and A. Quattrini Li, “Moving from ‘how to go there?’ to ‘where to go?’: Towards increased autonomy of mobile robots,” in *New Trends in Medical and Service Robots*, ser. Mechanisms and Machine Science, A. Rodič, D. Pisla, and H. Bleuler, Eds., vol. 20, Springer, 2014, pp. 345–356.

### FULLY-REFEREED CONFERENCE AND WORKSHOP PAPERS

- [C45] C. J. Carver, Z. Tian, A. Quattrini Li, and X. Zhou, “Amphilight: Direct air-water communication with laser light,” in *USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, (Best Paper Award), 2020.
- [C44] M. Jeong and A. Quattrini Li, “Risk vector-based near miss and real-time obstacle avoidance for autonomous surface vehicles,” in *IEEE International Conference on Intelligent Robots and Systems (IROS)*, (accepted), 2020.
- [C43] B. Joshi, M. Modasshir, T. Manderson, H. Damron, M. Xanthidis, A. Quattrini Li, I. Rekleitis, and G. Dudek, “DeepURL: Deep pose estimation framework for Underwater Relative Localization,” in *IEEE International Conference on Intelligent Robots and Systems (IROS)*, (accepted), 2020.
- [C42] S. Lensgraf, K. Itani, Y. Zhang, Z. Sun, Y. Wu, A. Quattrini Li, B. Zhu, E. Whiting, W. Wang, and D. Balkcom, “Puzzleflex: Kinematic motion of chains with loose joints,” in *IEEE International Conference on Robotics and Automation (ICRA)*, (accepted), 2020.

- [C41] M. Roznere, M. Jeong, L. Maechling, N. K. Ward, J. A. Brentrup, B. Steele, D. Bruesewitz, H. Ewing, K. Weathers, K. L. Cottingham, and A. Quattrini Li, “Towards a reliable heterogeneous robotic water quality monitoring system: An experimental analysis,” in *International Symposium on Experimental Robotics (ISER)*, (accepted), 2020.
- [C40] M. Roznere and A. Quattrini Li, “Underwater monocular depth estimation using single-beam echo sounder,” in *IEEE International Conference on Intelligent Robots and Systems (IROS)*, (accepted), 2020.
- [C39] Z. Tian, C. J. Carver, Q. Shao, M. Roznere, A. Quattrini Li, and X. Zhou, “Polartag: Invisible data with light polarization,” in *International Workshop on Mobile Computing Systems and Applications (HotMobile)*, (Best Demo Award), 2020.
- [C38] F. Amigoni, J. Banfi, N. Basilico, I. Rekleitis, and A. Quattrini Li, “Online update of communication maps for exploring multirobot systems under connectivity constraints,” in *Distributed Autonomous Robotic Systems*, N. Correll, M. Schwager, and M. Otte, Eds., Cham: Springer International Publishing, 2019, pp. 513–526.
- [C37] B. Joshi, S. Rahman, M. Kalaitzakis, B. Cain, J. Johnson, M. Xanthidis, N. Karapetyan, A. Hernandez, A. Quattrini Li, N. Vitzilaios, and I. Rekleitis, “Experimental comparison of open source visual-inertial-based state estimation algorithms in the underwater domain,” in *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2019.
- [C36] K. Masaba and A. Quattrini Li, “ROS-CBT: Communication benchmark tool for ROS (extended abstract),” in *IEEE International Symposium on Multi-robot and Multi-agent Systems (MRS)*, 2019.
- [C35] J. Moulton, N. Karapetyan, M. Kalaitzakis, A. Quattrini Li, N. Vitzilaios, and I. Rekleitis, “Dynamic autonomous surface vehicle controls under changing environmental forces,” in *Conference on Field and Service Robotics (FSR)*, 2019.
- [C34] A. Quattrini Li, H. Ewing, A. Bourbonnais, P. Stegagno, I. Rekleitis, D. Bruesewitz, K. Cottingham, D. Balkcom, M. Ducey, K. Johnson, S. Licht, D. Lutz, J. O’Kane, M. Palace, C. Roman, V. Subrahmanian, and K. Weathers, “Computational methods and autonomous robotics systems for modeling and predicting harmful cyanobacterial blooms,” in *IROS2019 workshop on Informed Scientific Sampling in Large-scale Outdoor Environments*, 2019.
- [C33] S. Rahman, A. Quattrini Li, and I. Rekleitis, “Contour based reconstruction of underwater structures using sonar, visual, inertial, and depth sensor,” in *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2019.
- [C32] —, “SVIn2: An underwater SLAM system using sonar, visual, inertial, and depth sensor,” in *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, (finalist for Best Application Paper Award), 2019.
- [C31] —, “Visual-acoustic SLAM for underwater caves,” in *ICRA2019 Workshop on Underwater Robotics Perception*, 2019.
- [C30] M. Roznere and A. Quattrini Li, “On the mutual relation between SLAM and image enhancement in underwater environments,” in *ICRA2019 Workshop on Underwater Robotics Perception*, Best paper award, 2019.
- [C29] —, “Real-time model-based image color correction for underwater robots,” in *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2019.
- [C28] H. Damron, A. Quattrini Li, and I. Rekleitis, “Underwater surveying via bearing only cooperative localization,” in *IEEE/RSJ International Conference on Intelligent Robots (IROS)*, 2018, pp. 3957–3963.
- [C27] N. Karapetyan, J. Moulton, J. S. Lewis, A. Quattrini Li, J. M. O’Kane, and I. Rekleitis, “Multi-robot Dubins coverage with autonomous surface vehicles,” in *IEEE International Conference on Robotics and Automation (ICRA)*, 2018, pp. 2373–2379.

- [C26] S. Manjanna, A. Quattrini Li, R. N. Smith, I. Rekleitis, and G. Dudek, “Heterogeneous multirobot system for exploration and strategic water sampling,” in *IEEE International Conference on Robotics and Automation (ICRA)*, 2018, pp. 1–8.
- [C25] M. Modasshir, A. Quattrini Li, and I. Rekleitis, “Deep neural networks: A comparison on different computing platforms,” in *Conference on Computer and Robot Vision (CRV)*, 2018, pp. 383–389.
- [C24] J. Moulton, A. Quattrini Li, and I. Rekleitis, “External force field modeling for autonomous surface vehicles,” in *International Symposium on Experimental Robotics (ISER)*, 2018.
- [C23] A. Quattrini Li, R. Fioratto, F. Amigoni, and V. Isler, “A search-based approach to solve pursuit-evasion games with limited visibility in polygonal environments,” in *International Conference on Autonomous & Multiagent Systems (AAMAS)*, 2018, pp. 1693–1701.
- [C22] S. Rahman, A. Quattrini Li, and I. Rekleitis, “Sonar Visual Inertial SLAM of Underwater Structures,” in *IEEE International Conference on Robotics and Automation (ICRA)*, 2018, pp. 1–7.
- [C21] J. Banfi, A. Quattrini Li, N. Basilico, I. Rekleitis, and F. Amigoni, “Multirobot online construction of communication maps,” in *IEEE International Conference on Robotics and Automation (ICRA)*, 2017, pp. 2577–2583.
- [C20] S. Manjanna, J. Hansen, A. Quattrini Li, I. Rekleitis, and G. Dudek, “Collaborative sampling using heterogeneous marine robots driven by visual cues,” in *Conference on Computer and Robot Vision (CRV)*, 2017, pp. 87–94.
- [C19] S. Manjanna, A. Quattrini Li, R. N. Smith, I. Rekleitis, and G. Dudek, “Adaptive exploration and sampling by heterogeneous robotic team,” in *International Symposium on Multi-Robot and Multi-Agent Systems (MRS)*, (Extended Abstract), 2017.
- [C18] P. K. Penumarthi, A. Quattrini Li, J. Banfi, N. Basilico, F. Amigoni, J. O’Kane, I. Rekleitis, and S. Nelakuditi, “Multirobot exploration for building communication maps with prior from communication models,” in *International Symposium on Multi-Robot and Multi-Agent Systems (MRS)*, 2017, pp. 90–96.
- [C17] N. Weidner, S. Rahman, A. Quattrini Li, and I. Rekleitis, “Underwater cave mapping using stereo vision,” in *IEEE International Conference on Robotics and Automation (ICRA)*, 2017, pp. 5709–5715.
- [C16] J. Banfi, A. Quattrini Li, N. Basilico, I. Rekleitis, and F. Amigoni, “Asynchronous multirobot exploration under recurrent connectivity constraints,” in *IEEE International Conference on Robotics and Automation (ICRA)*, 2016, pp. 5491–5498.
- [C15] A. Quattrini Li, F. Amigoni, and V. Isler, “Solving pursuit-evasion games with visibility in polygonal domains,” in *AAMAS2016 (International Conference on Autonomous Agents & Multiagent Systems) Workshop on “Autonomous Robots and Multirobot Systems (ARMS)”*, 2016.
- [C14] A. Quattrini Li, A. Coskun, S. M. Doherty, S. Ghasemlou, A. S. Jagtap, M. Modasshir, S. Rahman, A. Singh, M. Xanthidis, J. M. O’Kane, and I. Rekleitis, “Experimental comparison of open source vision based state estimation algorithms,” in *International Symposium on Experimental Robotics (ISER)*, 2016, pp. 775–786.
- [C13] A. Quattrini Li, I. Rekleitis, S. Manjanna, N. Kakodkar, J. Hansen, G. Dudek, L. Bobadilla, J. Anderson, and R. N. Smith, “Data correlation and comparison from multiple sensors over a coral reef with a team of heterogeneous aquatic robots,” in *International Symposium on Experimental Robotics (ISER)*, 2016, pp. 717–728.
- [C12] A. Quattrini Li, M. Xanthidis, J. M. O’Kane, and I. Rekleitis, “Active localization with dynamic obstacles,” in *IEEE/RSJ International Conference on Intelligent Robotics Systems (IROS)*, 2016, pp. 1902–1909.
- [C11] J. Banfi, A. Quattrini Li, N. Basilico, and F. Amigoni, “Communication-constrained multirobot exploration: Short taxonomy and comparative results,” in *IROS2015 Workshop on “On-line decision-making in multi-robot coordination”*, 2015.

- [C10] M. Ornaghi, A. Quattrini Li, J. Banfi, N. Basilico, and F. Amigoni, “Multirobot exploration with communication constraints: An experimental comparison,” in *AAMAS2015 Workshop on “Autonomous Robots and Multirobot Systems (ARMS)”*, 2015.
- [C9] A. Riva, A. Quattrini Li, and F. Amigoni, “Some performance bounds of strategies for graph exploration,” in *AAMAS2015 Workshop on “Autonomous Robots and Multirobot Systems (ARMS)”*, 2015.
- [C8] —, “Some performance bounds of strategies for graph exploration,” in *International Conference on Autonomous & Multiagent Systems (AAMAS)*, 2015, pp. 1815–1816.
- [C7] F. Amigoni, A. Quattrini Li, and D. Holz, “Evaluating the impact of perception and decision timing on autonomous robotic exploration,” in *European Conference on Mobile Robots (ECMR)*, 2013, pp. 68–73.
- [C6] R. Cipolleschi, M. Giusto, A. Quattrini Li, and F. Amigoni, “Semantically-informed coordinated multirobot exploration of relevant areas in search and rescue settings,” in *European Conference on Mobile Robots (ECMR)*, 2013, pp. 216–221.
- [C5] M. Luperto, A. Quattrini Li, and F. Amigoni, “A system for building semantic maps of indoor environments exploiting the concept of building typology,” in *17th annual RoboCup International Symposium*, 2013, pp. 504–515.
- [C4] A. Quattrini Li, L. Sbattella, and R. Tedesco, “PoliSpell: An adaptive spellchecker and predictor for people with dyslexia,” in *21st Conference on User Modeling, Adaptation and Personalization (UMAP)*, 2013, pp. 302–309.
- [C3] F. Amigoni, N. Basilico, and A. Quattrini Li, “How much worth is coordination of mobile robots for exploration in search and rescue?” In *RoboCup International Symposium*, 2012, pp. 106–117.
- [C2] A. Quattrini Li, N. Basilico, and F. Amigoni, “Searching for optimal off-line exploration paths in grid environments,” in *AAAI Conference on Artificial Intelligence (AAAI)*, 2012, pp. 2060–2066.
- [C1] L. Sbattella, R. Tedesco, A. Quattrini Li, E. Genovese, M. Corradini, G. Guaraldi, R. Garbo, A. Mangiatordi, and S. Negri, “The CATS project,” in *Advanced Information Technology in Education*, ser. Advances in Intelligent and Soft Computing, K. S. Thaug, Ed., vol. 126, Springer, 2012, pp. 265–272.

## LIGHTLY-REFEREED CONFERENCE AND WORKSHOP PAPERS

- [O18] M. Jeong, M. Roznere, S. Lensgraf, A. Sniffen, D. Balkcom, and A. Quattrini Li, “Catobot: Autonomous surface vehicle with an optimized design for environmental monitoring,” in *MTS/IEEE OCEANS – Singapore*, (student poster competition, top 20 submissions), 2020.
- [O17] M. Jeong, E.-B. Lee, Y.-S. Park, and A. Quattrini Li, “A risk visualization technique based on static and dynamic data for maritime mobility,” in *MTS/IEEE OCEANS – Seattle, WA*, 2019, pp. 1–5.
- [O16] S. Rahman, A. Quattrini Li, and I. Rekleitis, “The FPV drone racing VIO competition: Performance of SVIn2-a multi-sensor fusion based SLAM system with loop closing and relocalization,” in *IROS - The FPV Drone Racing VIO Competition*, 2019.
- [O15] J. Hansen, S. Manjanna, A. Quattrini Li, I. Rekleitis, and G. Dudek, “Autonomous marine sampling enhanced by strategically deployed drifters in marine flow fields,” in *MTS/IEEE OCEANS – Charleston, SC*, (Top 20 student submission), 2018, pp. 1–7.
- [O14] S. Malebary, J. Moulton, A. Quattrini Li, and I. Rekleitis, “Experimental analysis of radio communication capabilities of multiple autonomous surface vehicles,” in *MTS/IEEE OCEANS – Charleston, SC*, 2018, pp. 1–6.
- [O13] M. Modasshir, A. Quattrini Li, and I. Rekleitis, “MDNet: Multi-Patch Dense Network for coral classification,” in *MTS/IEEE OCEANS – Charleston, SC*, 2018, pp. 1–6.

- [O12] J. Moulton, N. Karapetyan, S. Bukhsbaum, C. McKinney, S. Malebary, G. Sophocleous, A. Quattrini Li, and I. Rekleitis, “An autonomous surface vehicle for long term operations,” in *MTS/IEEE OCEANS – Charleston, SC*, 2018, pp. 1–10.
- [O11] S. Rahman, A. Quattrini Li, and I. Rekleitis, “A modular sensor suite for underwater reconstruction,” in *MTS/IEEE OCEANS – Charleston, SC*, 2018, pp. 1–6.
- [O10] A. Quattrini Li, P. K. Penumarthy, J. Banfi, N. Basilio, F. Amigoni, I. Rekleitis, J. O’Kane, and S. Nelakuditi, “On building communication maps for reliable multirobot deployments,” in *RSS2017 Workshop on “Robot Communication in the Wild”*, 2017.
- [O9] —, “Online construction of communication maps for robust multirobot deployments,” in *IROS2017 Abstract*, 2017.
- [O8] S. Rahman, A. Quattrini Li, and I. Rekleitis, “Underwater Cave Mapping: Stereo Visual SLAM with IMU and Sonar,” in *IROS2017 Abstract*, 2017.
- [O7] A. Quattrini Li, A. Coskun, S. M. Doherty, S. Ghasemlou, A. S. Jagtap, M. Modasshir, S. Rahman, A. Singh, M. Xanthidis, J. M. O’Kane, and I. Rekleitis, “On understanding the challenges in vision-based shipwreck mapping,” in *ICRA2016 Workshop on “Marine Robot Localization and Navigation”*, 2016.
- [O6] —, “Vision-based shipwreck mapping: On evaluating features quality and open source state estimation packages,” in *MTS/IEEE OCEANS – Monterey*, 2016.
- [O5] M. Xanthidis, A. Quattrini Li, and I. Rekleitis, “Shallow coral reef surveying by inexpensive drifters,” in *MTS/IEEE OCEANS – Shanghai*, 2016, pp. 1–9.
- [O4] A. Quattrini Li, “Study, design, and evaluation of exploration strategies for autonomous mobile robots,” in *SIGAI Career Network Conference (CNC)*, 2015.
- [O3] F. Amigoni, M. Luperto, and A. Quattrini Li, “Towards more realistic indoor environments for the virtual robot competition,” in *RoboCup2014 CD*, 2014.
- [O2] F. Amigoni, A. Quattrini Li, G. A. Ferraro, F. Marini, A. M. Rizzi, and S. Salehi, “PoAReT team description paper,” in *RoboCup2013 CD*, 2013.
- [O1] A. Quattrini Li, “An adaptive spellchecker and predictor for people with dyslexia,” in *Proceedings of Doctoral Consortium in the 21st Conference on User Modeling, Adaptation and Personalization (UMAP)*, 2013, pp. 409–413.

#### TECHNICAL REPORTS

- [R1] A. Quattrini Li, “PoliSpell: An adaptive spellchecker and predictor for people with dyslexia,” Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Tech. Rep. 2013.31, 2013.

#### THESES

- [TS3] A. Quattrini Li, “Study, design, and evaluation of exploration strategies for autonomous mobile robots,” Ph.D. Dissertation, Dipartimento di Elettronica e Informazione, Politecnico di Milano, Piazza Leonardo da Vinci 32 – 20133 Milano – Italy, Mar. 2015.
- [TS2] —, “Development of a framework for evaluating performance of exploration strategies of autonomous robots,” M.Sc. Thesis, Dipartimento di Elettronica e Informazione, Politecnico di Milano, Piazza Leonardo da Vinci 32 – 20133 Milano – Italy, Oct. 2011.
- [TS1] A. Quattrini Li, A. Grassi, D. P. Clara Arango, A. Cavagna, and M. K. S. Olano, “Cityspaces,” M.Sc. Thesis, Alta Scuola Politecnica, Piazza Leonardo da Vinci 32 – 20133 Milano – Italy, Dec. 2011.

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## ROBOTS AND FIELD EXPERIMENTS

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In the following, a list of robots/sensors that I have worked with and/or contributed to the construction in the past and currently is presented.

### **Marine robots/sensor suite**

- MR1 Clearpath Kingfisher and Heron, Unmanned Surface Vehicle (USV).
- MR2 YSI i3X0 EcoMapper and Ocean Server Iver, Autonomous Underwater Vehicle (AUV).
- MR3 Mokai ES-Kape—a.k.a. “jetyak”—a motorized kayak customized at the Autonomous Field Robotics Lab, University of South Carolina, with a Pixhawk and an Intel NUC with Robot Operating System (ROS) to make it autonomous and modular for additional sensor payload.
- MR4 Custom-made underwater cameras for cooperative localization, with Inertial Measurement Unit (IMU).
- MR5 Custom-made underwater stereo rig with stereo camera, mechanical profiling sonar, pressure sensor, IMU.
- MR6 Custom-made marine surface drifters with camera, GPS, IMU, and cheap water quality sensors.
- MR7 Independent Robotics Aqua robots, Autonomous Underwater Vehicle (AUV).
- MR8 BlueRobotics BlueROV2, Remotely Operated Vehicle (ROV).
- MR9 Custom-made Unmanned Surface Vehicle designed by McGill University.
- MR10 Custom-made Unmanned Surface Vehicle designed in-house (Dartmouth College).

### **Flying robots**

- FR1 Parrot AR.Drone and Bebop, Unmanned Aerial Vehicles (UAV).
- FR2 Erle Robotics Erle copter, Unmanned Aerial Vehicles (UAV).
- FR3 DJI Matrice 100, Unmanned Aerial Vehicles (UAV).
- FR4 QuadH2O HexH2O Pro v2, Unmanned Aerial Vehicles (UAV).
- FR5 DJI Mavic 2 Pro, Unmanned Aerial Vehicles (UAV).
- FR6 DJI Mavic Mini, Unmanned Aerial Vehicles (UAV).

### **Ground robots**

- GR1 Husarion ROSbot 2.0 mobile robots.
- GR2 iRobot Create 1 and 2, indoor mobile robots.
- GR3 Clearpath Husky, an Unmanned Ground Vehicle (UGV).
- GR4 Turtlebot 1, 2, and 3 indoor mobile robots.
- GR5 KUKA youBot, mobile manipulator.



**Sensors**

- S1 YSI EXO1 and EXO2 water quality sensors.
- S2 EvoLogics Ultra-short baseline (USBL) S2CR 18/34.
- S3 WaterLinked Underwater GPS.
- S4 CruzPro ATU120AT underwater sonar.
- S5 Imagenex 831L pipe profiling, mechanical scanning underwater sonar.
- S6 Velodyne LiDAR VLP-16.
- S7 Hokuyo URG-04LX and UST-20LX, scanning laser range finder.
- S8 SICK LMS200, laser range finder.
- S9 Microsoft Kinect.
- S10 Intel RealSense D435.

**Field trials** I participated and/or supervised the following field trials (a select list in the marine domain is reported, with a brief description of the objectives):

- 30. Underwater perception, navigation, and data collection of shipwrecks with the BlueROV2 (Lake Winnepesaukee, 2020).
- 29. Testing and data collection with an Autonomous Surface Vehicle built in-house for lake monitoring (Lake China, Auburn, and Sabbatus, ME, 2020).
- 28. Testing and data collection with an Autonomous Surface Vehicle built in-house for lake monitoring (Lake Sunapee NH, 2020).
- 27. Underwater perception, navigation, and data collection with the BlueROV2 under the ice (Lake Sunapee, 2020).
- 26. Underwater manipulation and data collection with the BlueROV2 and scuba diving (Barbados, 2020).
- 25. Testing and data collection with an Autonomous Surface Vehicle built in-house for environmental monitoring (Barbados, 2020).
- 24. Testing and data collection with an Autonomous Surface Vehicle built in-house for lake monitoring (Lake Sunapee NH, 2019).
- 23. Testing and data collection with an Autonomous Surface Vehicle built in-house (Barbados, 2019).
- 22. Underwater manipulation and data collection with the BlueROV2 and scuba diving (Barbados, 2019).
- 21. Data collection and adaptive sampling algorithm deployments with two Autonomous Surface Vehicles built by McGill University (Barbados, 2018).
- 20. Scuba diving for data collection of cavern with underwater stereo rig on a dual unit DPV (Blue Grotto and Ginnie Springs, FL 2018).
- 19. Multiple jetyaks testing and data collection with LIDAR, cameras, depth, current, side scan sonar sensors (Congaree river, Columbia, SC, 2018).
- 18. Scuba diving for data collection of cavern with underwater stereo rig (Ginnie Springs, FL 2018).

17. Scuba diving for data collection of coral reefs with underwater stereo rig, and testing of underwater sensor nodes for cooperative localization (Barbados, 2018).
16. Scuba diving for ballasting, testing, and data collection of coral reefs with Aqua robots equipped with USBL (Barbados, 2018).
15. Testing and data collection with an Autonomous Surface Vehicle built by McGill University (Barbados, 2018).
14. Scuba diving for data collection of cavern with underwater stereo rig, and testing of underwater sensor nodes for cooperative localization (Ginnie Springs, FL 2017).
13. Multiple jetyaks testing, depth data collection, and proposed multirobot coverage algorithms deployment (Lake Murray, Columbia, SC, 2017).
12. Water quality data collection with a Clearpath Kingfisher equipped with a YSI EXO1 and CruzPro ATU120AT (Gault Nature Reserve, Montreal, Canada, 2017).
11. Scuba diving for USBL data collection with 2 Aqua robots (Kahnawake quarry, Montreal, Canada, 2017).
10. Scuba diving for underwater sensor nodes testing for cooperative localization (Kahnawake quarry, Montreal, Canada, 2017).
9. Data collection and deployment of proposed algorithms for plume front tracking during a pump opening in Lake Nighthorse with a YSI i3X0 EcoMapper and Clearpath Heron (Durango, CO, USA, 2017).
8. Deployment of proposed algorithms for active sampling of water quality in Rogers Reservoir and Lake Nighthorse with 2 Clearpath Heron and 10 drifters (Durango, CO, USA, 2017).
7. Scuba diving for data collection of partial overhead environment and some underwater man-made structures with the underwater stereo rig, including water leak and buoyancy testing (Fantasy Lake, NC 2017; Manatee Springs, FL 2017).
6. Deployment and data collection of shallow coral reefs with the custom-made drifters (Barbados, 2017).
5. Scuba diving for underwater stereo rig water leak and buoyancy testing, and data collection of coral reefs and shipwrecks (Barbados, 2017).
4. Deployment of proposed algorithms for active sampling with a heterogeneous multirobot system composed of drifters and Clearpath Kingfisher for monitoring a coral reef area (Barbados, 2017).
3. Deployment and data collection of shallow coral reefs with the custom-made drifters (Barbados, 2016).
2. Deployment of algorithms for autonomous water quality monitoring and sampling with 2 Clearpath Heron (Bernard Field Station and Fisherman Cove, CA, USA, 2016).
1. Deployment of heterogeneous multirobot systems composed of drifters, Clearpath Kingfisher, and YSI i3X0 EcoMapper for data collection (vision, side scan sonar) in a shallow coral reef area (Barbados, 2016).

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**TEACHING ACTIVITIES**

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## COURSES AS INSTRUCTOR

- Fall 2020** Co-Instructor (with Prof. Sean Smith) of “Responsible and Ethical Conduct of Research (COS700)” at Dartmouth College (Hanover NH, USA).
- Fall 2020** Instructor of “Artificial Intelligence (COS76/276)” at Dartmouth College (Hanover NH, USA).
- Fall 2020** Instructor of “Principles of Robot Design and Programming (COS81/281)” at Dartmouth College (Hanover NH, USA).
- Spring 2020** Instructor of “Problem Solving via Object Oriented Programming (COS10)” at Dartmouth College (Hanover NH, USA).
- Winter 2020** Instructor of “Robotics Perception Systems (COS69/169)” at Dartmouth College (Hanover NH, USA).
- Fall 2019** Co-Instructor (with Prof. Sean Smith) of “Responsible and Ethical Conduct of Research (COS700)” at Dartmouth College (Hanover NH, USA).
- Fall 2019** Instructor of “Principles of Robot Design and Programming (COS81/181)” at Dartmouth College (Hanover NH, USA).
- Spring 2019** Instructor of “Multirobot Systems (COS69/169)” at Dartmouth College (Hanover NH, USA).
- Winter 2019** Instructor of “Machine Learning for Robotics (COS89/189)” at Dartmouth College (Hanover NH, USA).
- Fall 2017** Instructor of “Robotics (CSCE574)” at University of South Carolina (Columbia SC, USA).
- Fall 2017** Instructor of “Robotic Applications and Design (CSCE274)” at University of South Carolina (Columbia SC, USA).
- Fall 2016** Instructor of “Robotic Applications and Design (CSCE274)” (two sections) at University of South Carolina (Columbia SC, USA).

## COURSES AS TEACHING ASSISTANT

- 2014 – 2015** Teaching Assistant of “Architetture degli Elaboratori I” (Computer Architectures I), held by Prof. Alberto Borghese and Prof. Federico Pedersini, B.Sc. in Computer Science, Università di Milano (Milan, Italy).
- 2013 – 2014** Teaching Assistant of “Fondamenti di Informatica” (Fundamentals of Computer Science), held by Prof. Lorenzo Mezzalira, B.Sc. in Electronical Engineering, Politecnico di Milano (Milan, Italy).
- 2012 – 2013** Lab. Supervisor of “Fondamenti di Informatica” (Fundamentals of Computer Science), held by Prof. Lorenzo Mezzalira, B.Sc. in Electronical Engineering, Politecnico di Milano (Milan, Italy).

## ADVISED STUDENTS THESES AND PROJECTS

- Monika Roznere, “Underwater Cooperative Robust Sensing”, Ph.D. student (NSF GRFP 2020 honorable mentioned), Dartmouth College, (Hanover NH, USA), 2018-Present.
- Kizito Masaba, “Communication Constrained Exploration”, Ph.D. student, Dartmouth College, (Hanover NH, USA), 2018-Present.

- Mingi Jeong, “Safe Obstacle Avoidance and Planning for Autonomous Surface Vehicles”, Ph.D. student, Dartmouth College, (Hanover NH, USA), 2019-Present.
- Siddharth Agrawal, M.Sc. student, Dartmouth College, (Hanover NH, USA), 2019-Present.
- Megan Ren, B.A. student (UGAR scholar), Dartmouth College, (Hanover NH, USA), 2020-Present.
- Brian Wang, B.A. student (UGAR scholar), Dartmouth College, (Hanover NH, USA), 2020-Present.
- Chloe Nicolaou, B.A. student, Dartmouth College, (Hanover NH, USA), 2020-Present.
- Alex Rodriguez, B.A. student (EE Just Fellow), Dartmouth College, (Hanover NH, USA), 2020-Present.
- Guilherme Marinho Ramos, B.A. student (UGAR scholar), Dartmouth College, (Hanover NH, USA), 2020-Present.
- Ioana-Andrada Pantelimon, B.A. student (Presidential scholar), Dartmouth College, (Hanover NH, USA), 2020-Present.
- John Weingart, B.A. student (Presidential scholar), Dartmouth College, (Hanover NH, USA), 2020-Present.
- Benjamin Wolsieffer, “Safe Navigation for Autonomous Sailboats under Uncertain Wind Conditions”, B.A. student (senior thesis with highest honors), Dartmouth College, (Hanover NH, USA), 2020.
- Lily Maechling, B.A. student (WISP intern), Dartmouth College, (Hanover NH, USA), 2020.
- Suzan Eskalen, B.A. student (WISP intern), Dartmouth College, (Hanover NH, USA), 2020.
- Geoffrey Huang, Christopher Esch, Matthew Parker, Matthew Cocks, “RoboCar”, B.E. students, Dartmouth College, (Hanover NH, USA), 2019-2020.
- Pengzhi Yang, Undergraduate Intern, Dartmouth College, (Hanover NH, USA), 2019.
- Yueshan Li, Undergraduate Intern, Dartmouth College, (Hanover NH, USA), 2019.
- James W. Beane, “Single-beam sonar for underwater obstacle avoidance”, B.Sc. student, Dartmouth College, (Hanover NH, USA), 2019.
- Craig Calhoun, Gary Garcia Donis, Ryan Hall, Reed Horton, Greg Hunter, Sean Weinstein, “Autonomous Drone Monitoring System”, B.E. students, Dartmouth College, (Hanover NH, USA), 2018-2019.
- Adam Carlson, Jesse Feldman-Stein, Taringana Guranungo, Carter Jacobsen, Jonah Sternthal, “Autonomous Control System for MVP”, B.E. students, Dartmouth College, (Hanover NH, USA), 2018-2019.

#### CO-ADVISED STUDENTS THESES AND PROJECTS

- Samuel Lensgraf, “Underwater construction”, Ph.D. student (NSF GRFP 2020 awardee), Dartmouth College, (Hanover NH, USA), Present.
- Yijia Wu, M.Sc. student, Dartmouth College, (Hanover NH, USA), Present.
- Evan Honnold, “Underwater construction”, M.Sc. student, Dartmouth College, (Hanover NH, USA), 2019.
- Jennifer Jain, “Underwater construction”, B.E. student, Dartmouth College, (Hanover NH, USA), 2019.

- Marco Orbelli, “Search-based Optimal Exploration”, M.Sc. student, Politecnico di Milano, (Milan, Italy), 2019.
- Raffaele Fioratto, “Solving pursuit-evasion games with visibility in polygonal domains”, M.Sc. student, Politecnico di Milano, (Milan, Italy), 2017.
- Emanuele Casarini, Matteo Martinelli, “Multirobot exploration with communication constraints”, M.Sc. students, Politecnico di Milano, (Milan, Italy), 2017.
- Cecelia Paciaroni, “Surveying of Abandoned Mines Via Autonomous Drones”, Research Experiences for Undergraduates (REU) in applied computational robotics, University of South Carolina, (Columbia, SC, USA), 2017.
- Jordan Miller, “Shipwreck Mapping: Combining Local and Global Optimization”, Research Experiences for Undergraduates (REU) in applied computational robotics, University of South Carolina, (Columbia, SC, USA), 2017.
- Anthony Grueninger, “Creating a Modular Platform for Aquatic Surface Research”, Research Experiences for Undergraduates (REU) in applied computational robotics, University of South Carolina, (Columbia, SC, USA), 2017.
- Giuseppe Andrea Ferraro, “Development and experimental analysis of single-robot obstacle avoidance methods”, M.Sc. student in Computer Science and Engineering, Politecnico di Milano, (Milan, Italy), 2016.
- Simone Pignatelli, “Evaluating the impact of perception and decision timing on autonomous robotic exploration”, M.Sc. student in Computer Science and Engineering, Politecnico di Milano (Milan, Italy), 2015.
- Mattia Ornaghi, “Experimental evaluation of multirobot exploration strategies under communication constraints”, M.Sc. student in Computer Science and Engineering, Politecnico di Milano (Milan, Italy), 2015.
- Sara Biancini, Stefano Carnovali, “Path evaluation as criterion for robotics exploration”, M.Sc. student in Computer Science and Engineering, M.Sc. student in Computer Science and Engineering, Politecnico di Milano (Milan, Italy), 2015.
- Alessandro Riva, “Online exploration of graphs with an autonomous robot: a theoretical analysis”, M.Sc. student in Computer Science and Engineering, Politecnico di Milano (Milan, Italy), 2014.
- Giuseppe Andrea Ferraro, Federico Marini, Alessandro Maria Rizzi, Sajjad Salehi, “PoAReT 2013 Team”, Virtual Robot competition of the RoboCup 2013 Rescue Simulation League (Eindhoven, The Netherlands), 2013.
- Matteo Luperto, “The concept of building typology for semantic labeling of rooms in autonomous mobile robotics”, M.Sc. student in Computer Science and Engineering, Politecnico di Milano (Milan, Italy), 2012.
- Riccardo Cipolleschi, Michele Giusto, “Analysis of semantic information role in multi-robot exploration in search and rescue”, M.Sc. student in Computer Science and Engineering, Politecnico di Milano (Milan, Italy), 2012.

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**STUDENTS AS TEACHING ASSISTANTS**

- Maxine Perroni-Scharf (undergrad) for COGS44-COSC 76/276 2020 Fall.
- Hunter Gallant (undergrad) for COGS44-COSC 76/276 2020 Fall.
- Almas Abdibayev (grad) for COGS44-COSC 76/276 2020 Fall.
- Mingi Jeong (grad) for COSC 81/281 2020 Fall.
- Monika Roznere (grad) for COSC 10 2019 Spring, COSC 81/281 2019 Fall.
- Aditya A. Choudhari (undergrad) for COSC 10 2019 Spring.
- Annika Kouhia (undergrad) for COSC 10 2019 Spring.
- Antony Guzman (undergrad) for COSC 10 2019 Spring.
- April Zhang (undergrad) for COSC 10 2019 Spring.
- Arij Elfaki (undergrad) for COSC 10 2019 Spring.
- Brandon Guzman (undergrad) for COSC 10 2019 Spring.
- Dylan Bienstock (undergrad) for COSC 10 2019 Spring.
- Dylan Whang (undergrad) for COSC 10 2019 Spring.
- Ivy Yan (undergrad) for COSC 10 2019 Spring.
- Jiachen Jiang (undergrad) for COSC 10 2019 Spring.
- John MacDonald (undergrad) for COSC 10 2019 Spring.
- Katherine Lasonde (undergrad) for COSC 10 2019 Spring.
- Laurel Dernbach (undergrad) for COSC 10 2019 Spring.
- Lily Maechling (undergrad) for COSC 10 2019 Spring.
- Luc Cote (undergrad) for COSC 10 2019 Spring.
- Morgan Sorbaro (undergrad) for COSC 10 2019 Spring.
- Piper Stacey (undergrad) for COSC 10 2019 Spring.
- Scott Gibbons (undergrad) for COSC 10 2019 Spring.
- Sudharsan Balasubramani (undergrad) for COSC 10 2019 Spring.
- Timothy Yang (undergrad) for COSC 10 2019 Spring.
- Vi Tran (undergrad) for COSC 10 2019 Spring.
- Vlado Vojdanovski (undergrad) for COSC 10 2019 Spring.
- Zander Hirsch (undergrad) for COSC 10 2019 Spring.

## OUTREACH

- Politecnico di Milano Open House (2013).
- University of South Carolina Big Friday (2015, 2016).
- University of South Carolina Open House (2016, 2017).
- STEM@TheNugget (2018).
- Hour of code at Ray School (2019).
- Ethics in robotics at Hanover High School (2019).
- Hanover High School STEM Pathways (2019).

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PROFESSIONAL SERVICE

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## CONFERENCE ORGANIZATION

- Publication chair, IEEE International Symposium on Multi-Robot and Multi-Agent Systems (MRS), 2019.
- Mobile App chair, IEEE International Conference on Robotics and Automation (ICRA) 2019.
- Organizing committee member, RSS2019 Workshop on Informative Path Planning and Adaptive Sampling (WIPPAS) 2019.

## CONFERENCE SESSION CHAIR

- International Symposium on Distributed Autonomous Robotic Systems (DARS) 2018.
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2018, 2019.

## PROGRAM COMMITTEE/ASSOCIATE EDITOR/PROPOSAL REVIEW PANELS

- Program Committee, AAAI Conference on Artificial Intelligence (AAAI) 2019, 2020, 2021.
- Program Committee, AAAI Conference on Artificial Intelligence Doctoral consortium (AAAI-DC), 2019, 2020, 2021.
- Program Committee, AAMAS Autonomous Robots and Multirobot Systems (ARMS) 2016, 2019, 2020.
- Program Committee, Autonomous Agents and Multiagent Systems (AAMAS) Robotics Track 2017, 2018, 2019.
- Program Committee, Autonomous Agents and Multiagent Systems (AAMAS) 2020, 2021.
- Program Committee, Conference on Robot Learning (CoRL) 2020.
- Program Committee, IEEE International Conference on Robotic Computing (IRC) 2019, 2020.
- Program Committee, IEEE INFOCOM Workshop: Wireless Communications and Networking in Extreme Environments (WCNEE) 2019, 2020.
- Program Committee, International Joint Conference on Artificial Intelligence (IJCAI) 2017, 2020, 2021.
- Program Committee, International Joint Conference on Artificial Intelligence Doctoral Consortium (IJCAI-DC) 2018.

- Program Committee, IROS2019 Workshop on Informed Scientific Sampling in Large-scale Outdoor Environments 2019.
- Associate Editor, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2017, 2018, 2019, 2020.
- Associate Editor, IEEE International Conference on Robotics and Automation (ICRA) 2019, 2020, 2021.
- Associate Editor, IEEE Robotics and Automation Letters (RA-L) 2018-present.
- NSF proposal review panels 2019, 2020.
- Natural Sciences and Engineering Research Council of Canada (NSERC) reviewer, 2019.
- Schmidt Oceanographic Institute proposal review 2019.

#### REVIEWING SERVICES

##### Conferences

- AAAI Conference on Artificial Intelligence (AAAI), 2017.
- European Conference on Mobile Robots (ECMR), 2019.
- IEEE International Conference on Robotics and Automation (ICRA), 2013, 2017.
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2012, 2014, 2015, 2016, 2018.
- International Symposium on Multi-Robot and Multi-Agent Systems (MRS), 2017, 2019.
- RoboCup Rescue Virtual Robots Competition.
- Robotics: Science and Systems (RSS), 2016.

##### Journals

- Advanced Robotics.
- Applied Science.
- Autonomous Robots.
- Computer Vision and Image Understanding.
- Energies.
- Frontiers in Robotics.
- IEEE Journal of Oceanic Engineering.
- IEEE Robotics and Automation Letters.
- IEEE Transactions on Instrumentation & Measurements.
- IEEE Transactions on Automation Science and Engineering.
- IEEE Transactions on Robotics.
- IEEE Transactions on Systems, Man, and Cybernetics.



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- International Journal of Control, Automation and System
  - Journal of Atmospheric and Oceanic Technology.
  - Journal of Autonomous Agents and Multi-Agent Systems.
  - Journal of Experimental & Theoretical Artificial Intelligence.
  - Journal of Field Robotics.
  - Language Resource and Evaluation.
  - Marine Technology Society (MTS) Journal
  - Ocean Systems Engineering.
  - Robotics.
  - Robotics and Autonomous Systems.
  - Sensors.
  - Sustainability.

#### Books

- Cambridge press.

#### Theses

- Mikel Vuka, “A Gaussian regression based exploration strategy for gas source localization”, M.Sc., Politecnico di Milano, (Milan, Italy), 2016.
- Fabrizio Casati, “ROS-Based Implementation and Evaluation of an Energy-Aware Multi-Robot System for Exploration”, M.Sc., Politecnico di Milano, (Milan, Italy), 2018.
- Sonia Greco, “Experimental analysis of the impact of communication models on exploration strategies for multirobot systems”, M.Sc., Politecnico di Milano, (Milan, Italy), 2019.
- Matteo Bellusci, “Multi-Agent Path Finding in Configurable Environments”, M.Sc., Politecnico di Milano, (Milan, Italy), 2019.

### SEMINARS, COLLOQUIA, AND INVITED TALK

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- “Systems and Algorithms for Autonomous Multiple Heterogeneous Robots in the Wild”, ISSNAF Award Mario Gerla Presentations, October 30, 2020.
- “Heterogeneous Team of Robots: Sampling in aquatic environments”, Department of Mechanical Engineering, Cornell University, NY, December 03, 2019.
- “AI and robotics technologies: a threat or an opportunity?”, Future of Work, Dartmouth College, Hanover, NH, October 10, 2019.
- “RII Track-2 FEC: Computational methods and autonomous robotics systems for modeling and predicting harmful cyanobacterial blooms”, Lake Sunapee Protective Association, Hanover, NH, August 8, 2019.

- Panelist in “Robotics in Education: Democratizing Access to Spark Innovation”, AWS Imagine, Seattle, WA, July 11, 2019.
- “Heterogeneous Team of Robots for Coordinated Exploration and Monitoring of Marine Environments”, Department of Robotics Engineering, Worcester Polytechnic Institute, Worcester, MA, November 16, 2018.
- “Exploration and Sampling with a Heterogeneous Team of Marine Robots”, Department of Mechanical Engineering, University of Rhode Island, Providence, RI, November 9, 2018.
- “Heterogeneous Team of Robots for Coordinated Exploration and Monitoring of Marine Environments”, Department of Computer Science, Stevens Institute of Technology, Hoboken, NJ, November 7, 2018.
- “Heterogeneous Team of Marine Robots for Coordinated Exploration and Monitoring of Marine Environments”, Graduate School of Oceanography, University of Rhode Island, Kingston, RI, April 10, 2018.
- “Heterogeneous Team of Robots for Coordinated Exploration and Monitoring of Marine Environments”, Department of Computer Science, University of Georgia, Athens, GA, March 28, 2018.
- “Heterogeneous Team of Marine Robots for Coordinated Exploration and Monitoring of Marine Environments”, Department of Computer Science, Dartmouth College, Hanover, NH, February 12, 2018.
- “Heterogeneous Team of Marine Robots for Coordinated Exploration and Monitoring of Marine Environments”, Department of Computer Science, Rochester Institute of Technology, Rochester, NY, February 7, 2018.
- “Heterogeneous Team of Marine Robots for Coordinated Exploration and Monitoring of Marine Environments”, Department of Ocean Engineering, Texas A&M University, College Station, Texas, February 1, 2018.
- “Heterogeneous Team of Marine Robots for Coordinated Exploration and Monitoring of Marine Environments”, Department of Computer Science and Engineering, University of South Carolina, Columbia, South Carolina, January 26, 2018.
- “Heterogeneous Team of Marine Robots for Coordinated Exploration and Monitoring of Marine Environments”, Department of Ocean Engineering, Texas A&M University, Galveston, Texas, December 19, 2017.
- “Heterogeneous Team of Marine Robots for Coordinated Exploration and Monitoring of Marine Environments”, MOOS Development and Applications Working Group (MOOS-DAWG2017), Cambridge, Massachusetts, August 1, 2017.
- “Multirobot systems for exploration: indoor and marine environments”, Department of Computer Science and Engineering, University of South Carolina, Columbia, South Carolina, January 20, 2017.
- Invited Talk “Multirobot systems for exploration: indoor and marine environments”, Department of Computer Science, Florida International University, Miami, Florida, October 21, 2016.
- Invited Talk “On efficient and robust coordination of multirobot systems”, IEEE CASE 2016 Workshop on Multi-Robot Systems in Automation: Topics in Planning and Control, August 21, 2016.
- “On the Study, Design, and Evaluation of Exploration Strategies for Autonomous Mobile Robots”, Department of Computer Science and Engineering, University of South Carolina, Columbia, South Carolina, April 10, 2015.

- “Design and evaluation of exploration strategies mixing metric and semantic information for autonomous mobile robots”, Department of Computer Science, University of Minnesota, Minneapolis, Minnesota, February 11, 2014.
- “PoliSpell”, Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Milan, Italy, October 2, 2013.

## ASSOCIATIONS MEMBERSHIP

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- AAAI, Association for the Advancement of Artificial Intelligence.
- IEEE, the Institute of Electrical and Electronics Engineers.
- IEEE RAS, Robotics and Automation Society.