Mirko Ferrati

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PROFESSIONAL EXPERIENCES

Aeolus Robotics
www.aeolusbot.com

Team Leader of Robot Behaviors — May 2020 - current
Leading the team responsible for high-level planning of autonomous behaviors for Aeolus humanoid service robot, developing new behaviors required by customers and managing the shared codebase common to all of them. As a lead my responsibilities include designing the behavior execution software, translating customer requirements into projects and tasks for each team member, mentoring and training developers, hiring new team members. .

Software Project Leader — Sep 2019 - Apr 2020
Supervision and management of software projects for creation of tools to improve Aeolus robots behaviors and tools.

Senior Autonomous Navigation Engineer — Sep 2018 - Apr 2020
Design, implementation and maintenance of c++ software modules used for autonomous navigation such as robot localization, high-level semantic graph planning, occupancy maps.

Magazino GmbH
www.magazino.eu

Team Leader of Robotic Navigation — Dec 2017 - Aug 2018
Leading the team responsible for coordination, navigation, localization and planning of robots movements in the logistics environments. Direct report to the CTO, handling customer requirements and internal development roadmap.

Robotic Software Developer — Oct 2016 - Nov 2017
Developer and maintainer of the hardware abstraction layer of an autonomous mobile manipulator (Toru), including ROS and CANopen integration. Software Architect and main developer of the firmware of embedded devices used inside the robot, supervising and helping other team members in developing the firmware.

Professional Qualification

Italian State Exam for Industrial Engineering — Nov 2012

Tagetik
www.tagetik.com

Cloud System Engineer — Sep 2011 - Sep 2012
Development of a cloud management Java application and port of Tagetik On-Premise software to Microsoft Azure virtual machines.

PROJECTS

Software architect and coordinator for Walk-Man robot — Jan 2014 - Jun 2015
Darpa Robotics Challenge [www.theroboticschallenge.com]
Design, development and maintenance of the software architecture of the humanoid robot Walk-man [www.walk-man.eu]. Coordinator of a team of 15 robotics developers engineers that were using the architecture in preparation for the Darpa Robotics Challenge, the team developed multiple software modules: planning, operator GUI, network communication, actuators firmware, robot hardware abstraction layer, whole body controllers.

Developer of a semantic planner for multiple end-effector manipulation — Mar 2015 - Sep 2015
Research and development of a semantic planner to coordinate a sequence of grasps and movements of multiple end-effector in order to manipulate an object. Kuka lightweight arms were used to test the planner.

EDUCATION AND TRAINING

Degree	**Ph.D (Doctorate) in Robotics**	Oct 2012 - Jul 2016

Research Center E.Piaggio, University of Pisa [www.centropiaggio.unipi.it]

Dissertation Title — Distributed Planning for Legged and Mobile Robots

Research and development of applications for trajectory planning and control of industrial robotic arms and humanoid robots. I developed C++ applications for low level hardware interfaces, kinematic control and motion planning, using YARP/ROS frameworks. I also developed novel coordination algorithms based on inter-robot wireless communication for path planning of multiple mobile robots.

Degree	**Master in Robotics and Control Engineering**	Feb 2010 - Oct 2012
Graduation	110/110 cum laude: full honors	University of Pisa [http://www.unipi.it]

Thesis title — Multi-agent collaborative protocol on Time Expanded Networks

I developed a novel algorithm that reduces energy consumption of autonomous vehicles by optimizing the traffic flow on the streets

Degree	**Master in Information Engineering**	Oct 2006 - Jun 2013
Graduation Mark	100/100 cum laude: full honors Sant'Anna School of Advanced Studies [http://www.sssup.it]

Thesis title — Ascari. A distributed robotics simulator with inter-robot communication capabilities

Holding a full 5-year scholarship won in a national competition (11 scholarships , 227 participants).

Visiting Student at Multimedia laboratory [gr-lsm.epfl.ch]	Aug 2010 - Sep 2010

École polytechnique fédérale de Lausanne, Lausanne, Switzerland

Development of a novel heuristic for a cache-aware optimized scheduler by graph inspection.

Degree	**Bachelor's in Computer Engineering**	Sep 2006 - Feb 2010
Graduation Mark	110/110 cum laude: full honors	

University of Pisa [http://www.unipi.it]

Thesis title — Reactive Behaviors for an autonomous robot in an unknown environment [youtu.be/ 57TKmCoCYWc]

Internship at Gustavo Stefanini laboratory [www.cgsrobotics.it]	Feb 2009 - Oct 2009

Development of an autonomous robot architecture with gps navigation and obstacles avoidance. Me and my team took part in the robotour competition [http://robotika.cz/competitions/ robotour/en] video: http://youtu.be/xrLirflCPus

PROFESSIONAL SKILLS AND COMPETENCES

Programming skills
Languages: Master in C++, Expert in Python and C, Beginner in JS/Html5, Java
Tools: Gdb, Valgrind, Perf, Docker, Jenkins
Libraries: Boost, STL, Qt, OpenGL
Team development: Git, Jira, Doxygen, Agile workflow

Robotics and Automation skills
Software: ROS, YARP, Gazebo, PCL, OpenCV, Path planning, Navigation, Localization
Systems: Mobile robots, Humanoid robots, Industrial arms, Robotic hands
Embedded: freeRTOS, CAN, CANopen
Simulation and numerical analysis: Matlab, Simulink, Mathematica

Management course
Attended a 4-full-day course on Management and Organizational Behavior from Challenge Learning Italia. The course focused on team management and coordination.

Driving license
Italian car driver license

Title The Walk-Man Robot Software Architecture

M. Ferrati, Settimi, A., Muratore, L., Tsagarakis, N., Natale,L., and Pallottino, L.

Frontiers in Robotics and AI, 2016

Title Multi-object handling for robotic manufacturing

M. Ferrati, Marino, H., Settimi, A., Nardi, S., and Pallottino, L.

42nd Annual Conference of the IEEE Industrial Electronics Society, IECON 2016, in press

Title A time expanded network based algorithm for safe and efficient distributed multi-agent coordination

M. Ferrati and Pallottino, L.

IEEE Conference on Decision and Control, Florence, Italy, 2013

Title On the Problem of Moving Objects With Autonomous Robots: A Unifying High-Level Planning Approach

H. Marino, Ferrati, M., Settimi, A., Rosales, C., and Gabiccini, M.

IEEE ROBOTICS AND AUTOMATION LETTERS, vol. 1, no. 1, pp. 469-476, 2016

Title Walk-Man: A High Performance Humanoid Platform for Realistic Environments

N.G.Tsagarakis , ..., M. Ferrati, ...

Journal of Field Robotics, 2016

Title ASCARI: a component based simulator for distributed mobile robot systems

M. Ferrati, Settimi, A., and Pallottino, L.

Modelling & Simulation for Autonomous Systems - MESAS2014, Rome, 5-6 May 2014, , vol. Lecture Notes in Computer Science, Volume 8906, pp. 152-163. 2014

Title Manipulation Framework for Compliant Humanoid COMAN: Application to a Valve Turning Task

A. Ajoudani, Lee, J., Rocchi, A., Ferrati, M., E. Hoffman, M., Settimi, A., Caldwell, D. G., Bicchi, A., and Tsagarakis, N. G.

IEEE-RAS International Conference on Humanoid Robots (HUMANOIDS 2014), Madrid, Spain, November 18 - 20, 2014

Title Upper-body Impedance Control with an Intuitive Stiffness Emulation for a Door Opening Task

J. Lee, Ajoudani, A., E. Hoffman, M., Rocchi, A., Settimi, A., Ferrati, M., Bicchi, A., Tsagarakis, N. G., and Caldwell, D. G.

IEEE-RAS International Conference on Humanoid Robots (HUMANOIDS 2014), Madrid, Spain, November 18 - 20, 2014

Title A modular approach for remote operation of humanoid robots in search and rescue scenarios

A. Settimi, Pavan, C., Varricchio, V., Ferrati, M., Mingo, E., Rocchi, A., Melo, K., Tsagarakis, N. G., and Bicchi, A.

Modelling & Simulation for Autonomous Systems MESAS2014, Rome, 5-6 May, 2014

Title Yarp Based Plugins for Gazebo Simulator

E. Mingo, Traversaro, S., Rocchi, A., Ferrati, M., Settimi, A., Romano, F., Natale, L., Bicchi, A., Nori, F., and Tsagarakis, N. G.

Modelling & Simulation for Autonomous Systems MESAS2014, Rome, 5-6 May, 2014