Alessandro **Roncone, Ph.D.**

ROBOTICS RESEARCHER · COMPUTER SCIENTIST · INTERACTION DESIGNER

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PERSONAL SUMMARY

The central motivating theme of my research is endowing robots with enough communication, perception and control capabilities in order for them to proficiently interact with humans in practical, near future applications. I develop technologies that equip robots with the skills to partner with humans in their daily activities, with the aim of eventually replacing them in dangerous, repetitive or burdensome tasks. Importantly, my goal is not to advance the state of the art in a specific area. Rather, I explicitly focus on shaping the research landscape in perception, control and human-robot interaction with the goal of developing technologies that enable close, natural, and extended cooperation with humans.

My research has spanned multiple fields, bridging the gap between robotics, human robot interaction, and artificial intelligence. Over the years, I have worked on i) exploring the breadths of how tactile systems can improve perception in the nearby space [**2014**, **2015**, **2016**], ii) implementing state of the art control systems for humanoid robots [**2014**, **2016**], and iii) investigating how non-verbal [**2016**] and physical [**2017**] communication can steer and improve human-robot interactions and advanced manufacturing.

EDUCATION

Ph.D. in Robotics ITALIAN INSTITUTE OF TECHNOLOGY [IIT] GENOA, IT 2012 – 2015

- Thesis title: *"Expanding sensorimotor capabilities of humanoid robots through multisensory integration. A study on the implementation of peripersonal space on the iCub"* [**2015**].

M.sc. in NeuroEngineering (110/110 *Summa cum Laude*) UNIVERSITY OF GENOA GENOA, IT 2008 – 2011

- Thesis title: *"Visuo-Haptic Integration for Object Characterization in an Unstructured Environment"*.

B.sc. in Biomedical Engineering (110/110 *Summa cum Laude*) UNIVERSITY OF GENOA GENOA, IT 2005 – 2008

- Thesis title: *"Support Vector Machine Analysis applied to a Manipulator in a Non-Structured Environment"*.

Student (with scholarship) INSTITUTE FOR ADVANCED STUDIES IN ICT [ISICT] GENOA, IT 2005 – 2008

- Successfully selected for scholarship, after thorough examination (only three positions available out of hundreds of candidates). Attended a number of supplementary courses (e.g. *Marketing*, *Management*, *Effective Communication*, and more).

RELEVANT EXPERIENCE

Post-Doc SOCIAL ROBOTICS LAB, COMPUTER SCIENCE DEPT, YALE UNIVERSITY NEW HAVEN, CT, USA 2015 – PRESENT

- I am focusing on the development of bidirectional, natural communication between the robot and the human in the context of human-robot collaborative tasks. I am generally working on the implementation of intuitive interactions, in order for them to be more efficient and effective, as well as less demanding for the human partner [**2017**].

Post-Doc ICUB FACILITY, ITALIAN INSTITUTE OF TECHNOLOGY [IIT] GENOA, IT 2015

- I continued the work started during my Ph.D. fellowship at the iCub Facility. Specifically, I was interested in the exploitation of the peripersonal space model I implemented during my Ph.D., by focusing toward two types of applications: i) *better, richer body representations* [**2014**, **2015**]; ii) *distributed motor control via whole-body awareness* [**2016**].
- Furthermore, I extended the *gaze stabilization* framework developed during my Ph.D. [**2014**] by integrating it with the existing iCub gaze controller [**2016**]. I was also contributing to an HRI project aimed at developing *natural interactions* between the iCub humanoid robot and humans during verbal communication [**2016**].

Robotics Engineer ICUB FACILITY, ITALIAN INSTITUTE OF TECHNOLOGY [IIT] GENOA, IT 2010 – 2014

- Multiple positions: *Research Fellow* (2010-2011), *Ph.D. Student* (2012-2014).
- Involved in the **XPERIENCE FP7-ICT-270273** and **WYSIWYD FP7-ICT-61239** projects, funded by the European Union Seventh Framework Program with a funding of € 7.634.000 and € 4.583.016 respectively.
- My research was aimed at improving the sensorimotor capabilities of the **ICUB** humanoid, by implementing a bio-inspired system able to learn a multisensory representation of the space around the robot's body (or *peripersonal space*).

SELECTED PUBLICATIONS

[**2017**] **A. Roncone**, O. Mangin, and B. Scassellati. TRANSPARENT ROLE ASSIGNMENT AND TASK ALLOCATION IN HUMAN–ROBOT COLLABORATION. In: *2017 IEEE Int. Conf. on Robotics and Automation [ICRA]*.

[**2016**] H. Lehmann, **A. Roncone**, U. Pattacini, and G. Metta. **PHYSIOLOGICALLY INSPIRED BLINKING BEHAVIOR FOR A HUMANOID ROBOT**. In: *8th Int. Conf. on Social Robotics [ICSR]*, pp. 83–93.

[**2016**] **A. Roncone**, U. Pattacini, G. Metta, and L. Natale. **A CARTESIAN 6-DOF GAZE CONTROLLER FOR HUMANOID ROBOTS**. In: *Proceedings of Robotics: Science and Systems [RSS]*.

[**2016**] **A. Roncone**, M. Hoffmann, U. Pattacini, L. Fadiga, and G. Metta. **PERIPERSONAL SPACE AND MARGIN OF SAFETY AROUND THE BODY: LEARNING VISUO-TACTILE ASSOCIATIONS IN A HUMANOID ROBOT WITH ARTIFICIAL SKIN**. In: *PLOS ONE*.

[**2015**] **A. Roncone**. **EXPANDING SENSORIMOTOR CAPABILITIES OF HUMANOID ROBOTS THROUGH MULTISENSORY INTEGRATION – A STUDY ON THE IMPLEMENTATION OF PERIPERSONAL SPACE ON THE ICUB**. PhD Dissertation. University of Genoa and Italian Institute of Technology.

[**2015**] **A. Roncone**, M. Hoffmann, U. Pattacini, and G. Metta. **LEARNING PERIPERSONAL SPACE REPRESENTATION THROUGH ARTIFICIAL SKIN FOR AVOIDANCE AND REACHING WITH WHOLE BODY SURFACE**. In: *2015 IEEE/RSJ Int. Conf. on Intelligent Robots and Systems [IROS]*, pp. 3366–3373.

[**2014**] S. R. Fanello, U. Pattacini, I. Gori, V. Tikhanoff, M. Randazzo, **A. Roncone**, F. Odone, and G. Metta. **3D STEREO ESTIMATION AND FULLY AUTOMATED LEARNING OF EYE-HAND COORDINATION IN HUMANOID ROBOTS**. In: *2014 IEEE-RAS Int. Conf. on Humanoid Robots*, pp. 1028–1035.

[**2014**] **A. Roncone**, M. Hoffmann, U. Pattacini, and G. Metta. **AUTOMATIC KINEMATIC CHAIN CALIBRATION USING ARTIFICIAL SKIN: SELF-TOUCH IN THE ICUB HUMANOID ROBOT**. In: *2014 IEEE Int. Conf. on Robotics and Automation [ICRA]*.

[**2014**] **A. Roncone**, U. Pattacini, G. Metta, and L. Natale. **GAZE STABILIZATION FOR HUMANOID ROBOTS: A COMPREHENSIVE FRAMEWORK**. In: *2014 IEEE-RAS Int. Conf. on Humanoid Robots*, pp. 259–264.

MISC

- **INVITED KEYNOTE SPEAKER** at the Synthetic Method in Social Robotics workshop, held at the *2016 International Conference on Social Robotics (ICSR '16)*. My talk dealt with the topic of Artificial Sociality in human-robot collaboration.
- **GUEST LECTURER** at the *Intelligent Robotics Course* in Yale University (2015 and 2016). I introduced students to the research performed at the Italian Institute of Technology with a talk titled "*iCub - a shared platform for research in Robotics and AI*".
- **TEACHING ASSISTANT** at the *2015 CBMM Summer School*, organized by a number of MIT lab groups and affiliates. I focused on tutoring students during their projects with the iCub. A notable achievement has been the integration of Google Glass onto the YARP framework, that has been later used in order to perform head/gaze teleoperation.
- **ORGANIZER** of the *"Development of body representations in humans and robots"* workshop, with Matej Hoffmann, Lorenzo Jamone, and Beata Grzyb. It was a half-day workshop at the ICDL-EPIROB 2014 Conference, in Genova, IT.
- Proud of being featured on the **IEEE SPECTRUM VIDEO FRIDAY** with my **2014 ICRA VIDEO** on self-calibration.

SKILLS

- Extensive background in **HUMANOID ROBOTICS**, **COGNITIVE ROBOTICS**, and **HUMAN-ROBOT INTERACTION**.
- **C++** developer, with a deep knowledge of the **YARP** and **ICUB** software libraries. Growing experience with the **ROS** middleware and the **BAXTER** robot. Familiar with the implementation and maintenance of **CROSS-PLATFORM SOFTWARE** for Linux, Windows, macOS via **CMAKE**. Comfortable with versioning (**CVS, SVN, GIT**), continuous integration (**TRAVIS**), and debugging (**GDB**). Proficient with **MATLAB/R, IPOPT, OPENCV, BASH, HTML5, CSS, JAVA/ANDROID**.
- Considerable background in **KINEMATICS, OPTIMIZATION, ROBOT CONTROL, DECISION MAKING, PLANNING UNDER UNCERTAINTY, CALIBRATION, TACTILE SENSING, MACHINE LEARNING, 2D AND 3D COMPUTER VISION, IMU PROCESSING**.
- Proven ability to *manage multiple projects* and *supervise multiple people* while meeting challenging deadlines. Mentored and trained technicians, Ph.D. students, and post-docs, adapting to various scientific levels and backgrounds.
- *Strong presentation/communication skills* thanks to experience in giving both technical and non-technical talks to both small and big groups, tailoring to the audience. Presented to major international robotics conferences, as well as several outreach events, ranging from exhibitions and fairs, to live TV shows and various interviews.
- Able to look at problems and solve them in the most logical way possible. Capable of carrying out well-executed engineering projects with an eye to clean, scalable code and making things—really—work.
- Demonstrated ability to work *both independently and in team settings*. Able to *value input from others* even if it comes from people who are reporting to me. Able to understand what motivates the people I am working with, and to leverage on their strengths and weaknesses in order to optimally distribute the amount of work a complex project is composed of. Able to *delegate*: something assigned to everyone is assigned to no one.
- Long-time **LINUX** user with deep knowledge of the Linux/UNIX OS, and active contributor of the Linux FOSS community.