# Alessandro **Roncone, Ph.D.**

ROBOTICS ENGINEER · COMPUTER SCIENTIST · INTERACTION DESIGNER

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## PERSONAL SUMMARY

**My work bridges the gap between robot planning and human–robot interaction**. I look at problems that lie at the intersection of these two fields, and I develop human-accessible robot control systems that cooperate with and empower people. I aim at lowering the barriers to entry for humans to naturally interact with robots, and in doing so I implement robot technologies that better interface with the external world and humans. To me, **the engineering is as important as the science**. As such, I implement technological advancements through production-quality software that uses modern software engineering workflows (*versioning*, *continuous integration*, *unit testing*, *containerization*). **I make robots work**, and I hold a deep commitment to doing so while implementing scalable, robust, and elegant code.

## RELEVANT EXPERIENCE

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

- I develop *transparent* robotic applications, that aim at fundamentally changing the interaction between humans and robots. I implement intuitive, human-centered technologies where robots transition from being recipients of human instructions to becoming proficient and proactive collaborators. My work revolves around the idea that shared knowledge and transparent commitment to the task are central for collaborative behaviors [**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**, **2018**].
- I implemented a state of the art *gaze stabilization* framework [**2014**]—later integrated with an existing *gaze controller* [**2016**]. My work in the topic formally solved the problem of controlling a binocular head to foveate toward an arbitrary 3D point in space, and concurrently exploiting redundancy to stabilize gaze at the same time. I also contributed to an HRI project aimed at developing natural *non-verbal behaviors* in the **iCub** humanoid robot during verbal communication [**2016**].

**Roboticist** ROBOTICS, BRAIN AND COGNITIVE SCIENCE DEPT, ITALIAN INSTITUTE OF TECHNOLOGY [IIT] — GENOA, IT 2010 – 2015

- 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.

## 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).

## SKILLS

### TECHNICAL SKILLS

- Extensive background in **HUMAN-ROBOT INTERACTION**, **HUMANOID ROBOTICS**, and **COGNITIVE ROBOTICS**.
- **5+ years'** research experience in the development of one of the most advanced robotic platforms out there, i.e. the **iCub**, a state-of-the-art, 53-DoF humanoid robot with a variety of sensors on board (camera, force sensors, tactile sensors). **2+ years'** experience with the **Baxter Research Robot**. My open-source code is available **HERE**, **HERE** and **HERE**.
- Considerable background in *kinematics, optimization, robot control, decision making, planning under uncertainty, tactile sensing, calibration, machine learning, computer vision, IMU processing, multisensory integration*.

- Mastery of **C++**. Extensive competence in **YARP, ROS, MATLAB/R, IPOPT, OPENCV, BASH, HTML5, CSS, JAVA/ANDROID**.
- 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**), debugging (**GDB**), unit testing (**GTEST**).

### COMMUNICATION SKILLS

- *Strong presentation and 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.
- Confident in *writing technical reports as well as scientific papers*. Authored and co-authored numerous international peer-reviewed scientific articles and journals. Experience with research grant writing.
- Experienced in carrying out well *balanced reports and presentations* thanks to significant background in graphic design.

### INTERPERSONAL AND TEAMWORK SKILLS

- Demonstrated 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.
- Solid *people skills*. Able to understand what motivates the people I am working with, to leverage their strengths and improve on their weaknesses. Able to value input from others even if it comes from people who are reporting to me.

### PERSONAL AND SELF-MANAGEMENT SKILLS

- Strong *self motivation*. To me life is an unending journey to self-improvement. I apply this philosophy to everything I do.
- Enthusiastic about Robotics and AI. Capable of carrying out clean, scalable projects and making things—really—work.
- Solid *organizational skills* with the ability to work under pressure, coordinate multiple projects and meet stringent deadlines.

### ADDITIONAL SKILLS

- Long-time **LINUX** user with 12+ years' daily usage of the Linux/UNIX OS, and active contributor of the Linux FOSS community.
- Experienced **GRAPHIC ARTIST** and freelancer. Design is problem solving, no different from engineering: design skills are advantageous for many engineering-related situations. Developer of two well known iconsets (**AWOKEN** and **FLATWOKEN**), and a number of websites. Commissioned with various design projects from a number of companies.
- Semi-professional *runner*: strengthened self-reliance and self-motivation, as well as ability to push until a project is done. Captain of a local water polo team during high school: developed teamwork and communication skills.
- Languages: **ITALIAN** (native proficiency), **ENGLISH** (full professional proficiency), **FRENCH** (elementary proficiency).

## SELECTED PUBLICATIONS


[**2018**] P. D. H. Nguyen, M. Hoffmann, **A. Roncone**, U. Pattacini, and G. Metta. **COMPACT REAL-TIME AVOIDANCE ON A HUMANOID ROBOT FOR HUMAN-ROBOT INTERACTION**. In: *2018 ACM/IEEE Int. Conf. on Human-Robot Interaction (HRI)*.

[**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.