ALESSANDRO RONCONE

I AM A ROBOTICS ENGINEER AND A DESIGNER

Personal Website: http://alecive.github.io

GitHub Page: http://github.com/alecive

WHO AM I

Energetic and resourceful Robotics Engineer with more than four years research experience and a proven publication track record. Motivated by intellectually challenging projects as well as personal achievements, I like to work hard and to learn new things by addressing new challenges. I love to be part of a team with bright people working toward the implementation of ambitious ideas, and I am enthusiastic toward the design and the realization of highly innovative tasks.

ME AT A GLANCE

- *Robotics Engineer* with *4 year full-time experience* with one of the most advanced robots out there, i.e. the **iCub**.
- Research interests: **robotics**, multisensory integration, calibration, kinematics, tactile sensing, machine learning, computer vision, sensor fusion.
- Some experience with signal processing, optimization (e.g. **IPOPT**, a software designed for large-scale nonlinear optimization problems), and control engineering.
- *C++ developer*, with a fine knowledge of **YARP** and **iCub** software and libraries.
- Some of my work is available to download at my **GitHub page**, or in the **Robotology GitHub Organization**.
- Long-time Linux user, and active contributor to the Linux FOSS community.
- Graphic Designer and freelancer in the spare time, with a number of successfull projects and employments.
- Obsessed by two things: *pixel-perfect graphics*, and *bit-perfect code*.

SUMMARY

Alessandro Roncone was born in Genova (GE), Italy, 1987. He received his *Bachelor's Degree in Biomedical Engineering* with the score of **110/110 with honors** at the "Università degli Studi di Genova" in February 2008. In July 2011 he completed his *Master Degree in NeuroEngineering* (with the score of **110/110 with honors**) in the same university. In April 2015 he got a Ph.D. in *Robotics, Cognition and Interaction Technologies* from the "Università degli studi di Genova" and "Istituto Italiano di Tecnologia". During his PhD he worked in the Cognitive Humanoids laboratory of the department of "Robotics, Brain and Cognitive Sciences" and the "iCub Facility" in IIT, Genova. The goal of his Ph.D. project is to exploit insights from neuroscience in order to implement a model of **Peripersonal Space (PPS)** on the iCub humanoid robot (see below for details on its Ph.D. project). He is currently working as a Post Doc at the iCub Facility in IIT.

PROFESSIONAL EXPERIENCE

NOV. 2015 – PRESENT YALE UNIVERSITY, NEW HAVEN, CT (USA)
POST DOC
Postdoctoral Associate @ Social Robotics Lab, Computer Science Department

JAN. – OCT. 2015 ISTITUTO ITALIANO DI TECNOLOGIA (IIT), GENOVA IT
POST DOC
Post Doc @ iCub Facility
I continued the work I 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 (in collaboration with CITEC @Bielefeld) ii) distributed motor control via whole-body awareness (partially collaborating with WYSIWYD project partners). Furthermore, I extended the gaze stabilization framework I developed during my Ph.D. by integrating it with an existing gaze controller. I was also contributing to a human-robot interaction project aimed at developing natural interaction(s) between the iCub humanoid robot and humans.

2012 – 2015 ISTITUTO ITALIANO DI TECNOLOGIA (IIT), GENOVA IT
PH.D. FELLOW @ ICUB FACILITY
Life and Humanoid Technologies
Doctoral course in Robotics, Cognition and Interaction Technologies. See the `*Education*` section below for details about my Ph.D. project. I have been 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.

OCT. – JUL. 2011 ISTITUTO ITALIANO DI TECNOLOGIA (IIT), GENOVA IT
RESEARCH FELLOW @ RBCS (ROBOTICS, BRAIN AND COGNITIVE SCIENCE)

I have partnered with the Italian Institute of Technology during my MSc thesis. See the `*Education*` section below for details about my master thesis.

JUL. – OCT. 2013 COOP LA LUCERNA
ICON DESIGNER

Icon Designer in outsourcing
Coop la Lucerna is a farm right in the middle of Pianura Padana, IT. During the process of restructuring their online offerings, they contacted me in order to implemented a set of icons for their website. The icons were a set of 20 vegetables, rendered in a flat and minimal look.

OCT. – DEC. 2011 MAGOR CORP.
ICON DESIGNER

Icon Designer in outsourcing
I have been contacted in order to design a new set of icons for their tele-collaboration software (a Skype-like alternative oriented toward telepresence and teleconference). I designed a total of 30 icons.

FEB. – MAR. 2010 THE CASTLE PROJECT
ICON DESIGNER

Icon Designer in outsourcing
I implemented a set of icons for their website. It was a non-profit organization based in Edinburgh aimed toward taking care of drug- and alcohol- addicts, so I had some fun in designing some drug-related icons.

EDUCATION

2012 – 2015 ISTITUTO ITALIANO DI TECNOLOGIA (IIT), GENOVA IT
PH.D. IN LIFE AND HUMANOID TECHNOLOGIES

Thesis title `Expanding sensorimotor capabilities of humanoid robots through multisensory integration. A study on the implementation of peripersonal space on the iCub.`
I focused on 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*). The robot is equipped with a whole-body artificial skin and learns the consequences of its interaction with the self and the environment by means of a multisensory (tactile-motor and tactile-visual) representation. This results in the extension of the robot's tactile domain toward the nearby space, in such a way that it implicitly copes with modeling or calibration errors. Finally, this representation is then exploited with a sensory-

based guidance of the motor actions performed by the robot. That is, an avoidance and catching controller capable of using any body part in order to either prevent collision with or come into contact with incoming objects.

2008 – 2011 UNIVERSITÀ DEGLI STUDI DI GENOVA, IT

M.SC. WITH HONORS IN NEUROENGINEERING

Thesis title `Visuo-Haptic Integration for Object Characterization in an Unstructured Environment`

I developed a multisensory machine learning system in order to improve the detection and the identification of objects in the iCub robot's workspace. Specifically, I implemented an SVM-based system able to integrate between the visual system and the haptic information coming from the F/T sensor of the iCub robot. The system proved to be successful in improving the vision-based detection of a set of objects by means of the haptic exploration of the same objects.

2005 – 2009 UNIVERSITÀ DEGLI STUDI DI GENOVA, IT

B.SC. WITH HONORS IN BIOMEDICAL ENGINEERING

Thesis title `Support Vector Machine Analysis applied to a Manipulator in a Non-Structured Environment`

I carried out a system able to control a PUMA robotic arm and develop a goalkeeper-like behavior in an air hockey setup. The robot used SVMs in order to understand which of the puck trajectories he previously experienced was scoring a point. Based on this, it learned the ability to prevent such points by predicting the final outcome of a trajectory given some initial samples. Its success rate was beyond 95%.

2005 – 2008 ISICT (ISTITUTO SUPERIORE DI STUDI IN TECNOLOGIE DELL'INFORMAZIONE E DELLA COMUNICAZIONE)

STUDENT (WITH SCHOLARSHIP) AT ISICT

ISICT stands for *Institute for Advanced Studies in Information and Communication Technologies*. It is a consortium that integrates the courses provided by the University of Genoa with lessons held by industry leaders. The goal is to better prepare students for the labor market. To this end, I attended a number of additional courses ranging from *Marketing* to *Telecommunications* to *Aerospace Engineering*. I've been also selected for a scholarship, after a thorough examination (only three positions were available).

PUBLICATIONS

2015 IEEE/RSJ INTERNATIONAL CONFERENCE ON INTELLIGENT ROBOTS AND SYSTEMS

LEARNING PERIPERSONAL SPACE REPRESENTATION THROUGH ARTIFICIAL SKIN FOR AVOIDANCE AND REACHING WITH WHOLE BODY SURFACE

Alessandro Roncone, Ugo Pattacini, Giorgio Metta, and Lorenzo Natale

2014 IEEE-RAS INTERNATIONAL CONFERENCE ON HUMANOID ROBOTS

GAZE STABILIZATION FOR HUMANOID ROBOTS: A COMPREHENSIVE FRAMEWORK

Alessandro Roncone, Ugo Pattacini, Giorgio Metta, and Lorenzo Natale

2014 IEEE-RAS INTERNATIONAL CONFERENCE ON HUMANOID ROBOTS

3D STEREO ESTIMATION AND FULLY AUTOMATED LEARNING OF EYE-HAND COORDINATION IN HUMANOID ROBOTS

S. R. Fanello, U. Pattacini, I. Gori, V. Tikhanoff, M. Randazzo, A. Roncone, F. Odone, and G. Metta

2014 IEEE INTERNATIONAL CONFERENCE ON ROBOTICS AND AUTOMATION (ICRA)

AUTOMATIC KINEMATIC CHAIN CALIBRATION USING ARTIFICIAL SKIN: SELF-TOUCH IN THE ICUB HUMANOID ROBOT

Alessandro Roncone, Matej Hoffmann, Ugo Pattacini, and Giorgio Metta

It was featured at the IEEE Spectrum Video Friday!

MISC

2015 CBMM 2015 SUMMER SCHOOL

Woods Hole, MA, August 13-September 3, 2015

TEACHING ASSISTANT

Alessandro Roncone, Carlo Ciliberto, Giulia Pasquale and Raffaello Camoriano

I attended the Summer School as a teaching assistant: I gave a talk about my research on the iCub humanoid robot, but I mainly focused on tutoring some students during their projects. 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.

2014 IEEE INTERNATIONAL CONFERENCE ON DEVELOPMENT AND LEARNING AND ON EPIGENETIC ROBOTICS

Genoa, Italy, October 13-16, 2014

CO-ORGANIZER OF THE *DEVELOPMENT OF BODY REPRESENTATIONS IN HUMANS AND ROBOTS* WORKSHOP

Matej Hoffmann, Alessandro Roncone, Lorenzo Jamone, and Beata Grzyb

Half-day workshop @ICDL-EPIROB 2014 Conference. The goal of the workshop was to *explore the possibility of robots developing models inspired by the mechanisms of human body representations*. In this way, they can on one hand become new modeling tools for empirical sciences - expanding the domain of computational modeling by anchoring it to the physical environment and a physical body. On the

other hand, robot controllers endowed with multimodal whole-body awareness and plasticity typical of humans should give rise to - in robotics unprecedented - autonomy, robustness, and resilience.

2014 INTERNATIONAL CONFERENCE ON INFANT STUDIES

Berlin, Germany, July 3-5, 2014

MODELING THE DEVELOPMENT OF BODY KNOWLEDGE USING HUMANOID ROBOTS

Matej Hoffmann, *Alessandro Roncone*, *Giorgio Metta*

Oral presentation at the *International Conference on Infant Studies* on my work related to the double-touch (made by Matej).

2013 SMLC - WORKSHOP ON SYNTHETIC MODELING OF LIFE AND COGNITION: OPEN QUESTIONS

Bergamo, Italy, September 12-14, 2013

MODELING THE DEVELOPMENT OF HUMAN BODY REPRESENTATIONS

Matej Hoffmann, *Alessandro Roncone*, *Giorgio Metta*

Oral presentation at the workshop on *Synthetic Modeling of Life and Cognition*: Open Questions.

2013-2014 IIT (ISTITUTO ITALIANO DI TECNOLOGIA)

iCub Facility

RESEARCHER OF THE WEEK

I've been researcher of the week for two times. Despite its name, this award is given very rarely to outstanding research performed in the iCub Facility at IIT. In the past two years, only 6 of these awards have been given.

GRAPHIC DESIGN

2013 - 2014

FLATWOKEN ICONS

2010 - 2013

AWOKEN ICONS

SKILLS AND TECHNICAL EXPERTISE

Programming **Skills:**

C++ MATLAB CSS3 & HTML5 IPOPT BASH OPENCV UX/UI CMAKE R PYTHON

Versioning Systems Skills: GIT SUBVERSION CVS

Mobile Skills: ANDROID DEVELOPMENT

OS/Software Skills: LINUX WINDOWS GIMP INKSCAPE

Languages: ITALIAN ENGLISH

> This CV has been auto(-*magically*) generated from the correspondent page on my personal website. For this reason, there may be some formatting problems here and there. Compilation Date: *November 11, 2015*