ALESSANDRO RONCONE

I AM A ROBOTICS ENGINEER AND A DESIGNER

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

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 (http://www.icub.org)**.
- Research interests: **robotics**, multisensory integration, calibration, kinematics, tactile sensing, machine learning, computer vision, sensor fusion.
- Some experience with signal processing, optimization (e.g. **IPOPT (https://projects.coin-or.org/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 (http://github.com/alecive/)**, or in the **Robotology GitHub Organization (https://github.com/robotology)**.
- 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.

EDUCATION

2012 – 2015

ISTITUTO ITALIANO DI TECNOLOGIA (IIT), GENOVA IT (HTTP://WWW.IIT.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.`
Abstract: The new generation of robotic devices will require machines able to adequately perform rich interactions with objects -- and eventually humans -- in their environment. This aspect will prove fundamental in the context of moving robots from the controlled domains typical of a factory environment toward our -- much less structured -- everyday life. To this end, robots need the ability to express some sort of awareness of their body and their surroundings: instead of focusing exclusively on the end-effector as the only part that interacts with the environment, the robotic field needs to move toward a more distributed, decentralized representation of the self and the nearby space. More importantly, albeit a consistently improving technology, robotic systems are equipped with inherently faulty systems characterized by calibration and systematic errors that need to be effectively coped with. This thesis deals with the formalization and the development of a system able to let a humanoid robot learn a multisensory representation of the space around its 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 lets the robot to implicitly cope with modeling or calibration errors. Further, this representation is put under testing 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 (HTTP://WWW.UNIGE.IT)
M.SC. WITH HONORS IN NEUROENGINEERING

Thesis title `Visuo-Haptic Integration for Object Characterization in an Unstructured Environment`
I implemented a multisensory machine learning system in order to improve the detection and the identification of an object 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 (HTTP://WWW.UNIGE.IT)
B.SC. WITH HONORS IN BIOMEDICAL ENGINEERING

Thesis title `Support Vector Machine Analysis applied to a Manipulator in a Non-Structured Environment`
I implemented a system able to control a PUMA robotic arm and develop a goalkeeper-like behavior in an air hockey setup. The robot was using a supervised learning technique 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 acquisitions. Its success rate was beyond 95%.

2005 - 2008

ISICT (ISTITUTO SUPERIORE DI STUDI IN TECNOLOGIE DELL'INFORMAZIONE E DELLA COMUNICAZIONE) (HTTP://WWW.ISICT.IT/)
STUDENT (WITH SCHOLARSHIP) AT ISICT

ISICT stands for *Institute of 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

2014

IEEE-RAS International Conference On Humanoid Robots

Madrid, Spain, November 18-20, 2014

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

Madrid, Spain, November 18-20, 2014

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)

Hong Kong, China, May 31-June 7, 2014

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! (http://spectrum.ieee.org/automaton/robotics/robotics-software/video-friday-robot-racecar-kilobot-display-humanoid-skin)

MISC

2014

IEEE International Conference On Development And Learning And On Epigenetic Robotics

Genoa, Italy, October 13-16, 2014

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

The 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*.

2013

SMLC '13 – 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)

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.

PROFESSIONAL EXPERIENCE

2015 - Present

Istituto Italiano Di Tecnologia (IIT), Genova IT (Http://Www.Iit.It)

POST DOC

Post Doc @ iCub Facility

2012 - 2015

Istituto Italiano Di Tecnologia (IIT), Genova IT (Http://Www.Iit.It)

PH.D. FELLOW

Life and Humanoid Technologies
Doctoral course in Robotics, Cognition and Interaction Technologies. See the `*Education*` section above for details about my Ph.D. thesis.

Jul. - Oct. 2013

Coop La Lucerna (Http://Cooplalucerna.It/)

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 basically a set of 20 vegetables, rendered in a flat and minimal look.

Oct. - Dec. 2011

Magor Corp. (Http://Www.Magorcorp.Com/)

ICON DESIGNER

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

Feb. - Mar. 2010

The Castle Project (Http://Www.Castleproject.Org.Uk/)

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.

GRAPHIC DESIGN

2013 - Present

FLATWOKEN ICONS

2010 - 2013

AWOKEN ICONS

SKILLS AND TECHNICAL EXPERTISE

Programming Skills:

C++ MATLAB CSS3 & HTML5 IPOPT BASH OPENCV R PYTHON

CM 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: *April 30, 2015*