ALESSANDRO RONCONE

CURRICULUM VITAE

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 **Robotology (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 University of 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. He is currently a *Ph.D. fellow at iCub Facility*, *Istituto Italiano di Tecnologia*, *GENOVA*, *Italy*. 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. See below for details on its Ph.D. project.

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`
In my thesis, I implemented a system able to leverage on a multisensory-based machine learning system in order to improve the detection and the identification of an object in the robot's workspace. In particular, 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`
This work dealt with the implementation of a system able to control a robotic arm and develop a goalkeeper-like behavior in an air hockey setup. The robot was using a supervised learning setup in order to understand which of the puck trajectories he previously experienced was scoring a point, and eventually developed the ability to prevent such points by predicting the final outcome of a trajectory given some initial acquisitions.

2005 – 2008

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

ISICT is an acronym, that stands for *Institute of Advanced Studies in Information and Communication Technologies*. It is a consortium created in May 2003 that supports the courses provided by the University of Genoa in order to integrate them with a teaching that is the result of close collaboration between universities, companies and agencies. The goal is to prepare young people for integration into the labor market, and as such I attended a number of additional courses ranging from *Marketing* to *Telecommunications* to *Aerospace Engineering*. I've been also selected for a scolarship, 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

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 has been 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. Consequently, complete sensorimotor loops can be instantiated and not only algorithms but whole behaviors validated. 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.

PROFESSIONAL EXPERIENCE

2012 – Present

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++ OPENCV IPOPT MATLAB CSS3 & HTML5 BASH R PYTHON

CM Skills:

GIT SUBVERSION

Mobile Skills:

ANDROID DEVELOPMENT

OS/Software Skills:

LINUX WINDOWS GIMP INKSCAPE

Languages:

ITALIAN ENGLISH FRENCH

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: *March 21, 2015*