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 five years research experience and a proven publication track record. Motivated by intellectually challenging projects as well as personal achievements, I like to learn new things by stimulating myself with new goals. I am capable of pursuing individual research aimed at the development of novel applications, but I particularly love to be part of a team with bright people working toward ambitious ideas. I am enthusiastic toward the design and the realization of highly innovative tasks, and I love to work hard in pursuance of them.

ME AT A GLANCE

- *Robotics Engineer* with *5 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.
- Considerable background in employing optimization techniques in real-world robotic applications: knowledgeable in particular about **IPOPT**, a software designed for large-scale nonlinear optimization problems. Some experience with control engineering and signal processing.
- *C++ developer*, with a fine knowledge of **YARP** and **iCub** software and libraries. Some experience with the **ROS** middleware.
- 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 BSc in Biomedical Engineering with the score of *110/110 summa cum laude* at the **Università degli Studi di Genova** in February 2008. In July 2011 he completed his MSc in NeuroEngineering (with the score of *110/110 summa cum laude*) in the same university. In April 2015 he got a Ph.D. in *Robotics, Cognition and Interaction Technologies* from **Università degli studi di Genova** and **Italian Institute of Technology (IIT)**. During his PhD he worked in the *Robotics, Brain and Cognitive Sciences* department and the *iCub Facility* in IIT, Genova, under the supervision of prof. **Giorgio Metta**. The goal of his Ph.D. project was 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 Postdoctoral Associate at the **Social Robotics Lab** in Yale University, with a focus on human robot collaboration and collaborative manufacturing.

PROFESSIONAL EXPERIENCE

Nov. 2015 - present Yale University, New Haven, CT (USA)

POST-DOC

Postdoctoral Associate @ Social Robotics Lab, Computer Science Department

I am currently focusing on the exploitation of bidirectional communication between the robot and the human in the context of human-robot collaborative tasks. I am working toward the implementation of a more natural and intuitive interaction, in order for it to be more efficient and effective, as well as less demanding for the human partner.

Jan. - Oct. 2015 Italian Institute of Technology (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 - 2014 Italian Institute of Technology (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. 2010 - Jul. 2011 Italian Institute of Technology (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 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 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 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 Italian Institute of Technology (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 it 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 (Superior Institute of Studies in Information and Communication Technologies)

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

2016 International Conference on Social Robotics (ICSR)

PHYSIOLOGICALLY INSPIRED BLINKING BEHAVIOR FOR A HUMANOID ROBOT

Hagen Lehmann, Alessandro Roncone, Ugo Pattacini, and Giorgio Metta

2016 PLOS ONE

PERIPERSONAL SPACE AND MARGIN OF SAFETY AROUND THE BODY: LEARNING VISUO-TACTILE ASSOCIATIONS IN A HUMANOID ROBOT WITH ARTIFICIAL SKIN

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

2016 Robotics: Science and Systems

A CARTESIAN 6-DOF GAZE CONTROLLER FOR HUMANOID ROBOTS

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

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

TEACHING ASSISTANT

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 on the iCub.

2014 IEEE International Conference on Development and Learning and on Epigenetic Robotics

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

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

MODELING THE DEVELOPMENT OF BODY KNOWLEDGE USING HUMANOID ROBOTS

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

2013 SMLC - Workshop on Synthetic Modeling of Life and Cognition

MODELING THE DEVELOPMENT OF HUMAN BODY REPRESENTATIONS

Invited to give an oral presentation at the workshop on *Synthetic Modeling of Life and Cognition*.

2013-2014 IIT (Italian Institute of Technology)

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 years, only 8 of these awards have been awarded.

GRAPHIC DESIGN

2013 - 2014

FLATWOKEN ICONS

My second icon pack capitalized on the experience I gained while working on the AwOken project, and was a much more refined long-shadow set.

2010 - 2013

AWOKEN ICONS

My most awarded and recognized graphics projects. It has been downloaded more than a million times in less than one year, and has been for a while the most downloaded icon set on Linux ever.

SKILLS AND TECHNICAL EXPERTISE

Programming:

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

Robots & Platforms: ICUB YARP ROS BAXTER

Versioning Systems: GIT SUBVERSION CVS

Mobile: ANDROID DEVELOPMENT

OS/Software: 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: *October 13, 2016*