Giulia Vezzani

Via di Montorsoli, 478
50036, Vaglia (Florence),Italy
+39 339 8072183
giulia.vezzani@iit.it
giuliavezzani
giuliavezzani

Who I am

I'm an automation engineer, eager to improve my knowledge in humanoid robotics and to give a personal contribution to the research. My work and my studies are motivated by personal achievements as well as my passion on robotics. During my study and my research experience, I showed an excellent capability of reaching goals by working on individual basis and teaming up with my collegues. I feel dealing with challenging problems very exciting and thus I am very prone to work hard and find suitable solutions.

6 facts about me

- *Automation engineer*, with one year experience on the humanoid robot *iCub*.
- Considerable *theoretical background* in automation and Bayesian filtering.
- Proven *C++ skills*, with a good knowledge of YARP and iCub libraries.
- 3 years experience on *Linux-based* systems.
- *Hardware experience* with the humanoid robotic platform iCub.
- Main interests in *humanoid robotics*: grasping, localization, manupilation, perception, vision and 3D object modeling.

Short Bio

I was born in Florence in 1991. I got my Bachelor's degree in Electronic and Telecommunications Engineering (cum laude) in July 2013 at the Universita' degli Studi di Firenze. In the same university, in October 2015, I held my Master's degree (cum laude) in Electrical and Automation Engineering, with the dissertation of the thesis "3D object tactile localization for the humanoid robot iCub." Currently, I am a PhD fellow in Bioengineering and Advanced Robotics - curriculum Advanced and Humanoid Robotics - at the Istituto Italiano di Tecnologia in Genova, iCub Facility, in collaboration with the Universita' di Genova. The goal of my PhD program is to improve object localization and manipulation for humanoid robots, by exploiting both visual and tactile information and to implement and test the developed techniques on the humanoid robot iCub.

Experience

November, 2015 - currently

Phd Fellow @ iCub Facility (Istituto Italiano di Tecnologia), *Bioengineering and Advanced Robotics, curriculum Humanoid and Advanced Robotics*, Istituto Italiano di Tecnologia & Universita' di Genova, Genova, Italy.

My research project consists of improving 3D object modeling, localization, grasping and manipulation, by merging vision and tactile information for the humanoid robot iCub.

November, 2016 - February, 2017 **European Project TacMan: Tactile Manipulation**, *project founded by the European Union*, FP7 ICT Cognitive System and Robotics, no. 610967.
My work for the TacMan project contributed to improving recognition and manipulation skills for the humanoid robot iCub. I developed a model-based tactile object localization and recognition algorithm and a novel pipeline in order to make the iCub robot perform the handover task, i.e. transfer an object from one hand to the other.

August - September, 2016 **Brains, Minds and Machines Summer School 2016**, *organized by Harvard Medical School and Massachusetts Institute of Technology*, Woods Hole, Massachusetts, US..
An intensive three-week course will give advanced students a "deep end" introduction to the problem of intelligence – how the brain produces intelligent behavior and how we may be able to replicate intelligence in machines. (Selected students: 30/300 nearly.)

July, 2016 **International Computer Vision Summer School 2016 (ICVSS)**, *organized by University of Cambridge and University of Catania*, Ragusa, Italy.
The tenth edition of the International Computer Vision Summer School aims to provide both an objective and clear overview and an in-depth analysis of the state-of-the-art research in Computer Vision. The courses will be delivered by world renowned experts in the field, from both academia and industry, and will cover both theoretical and practical aspects of real Computer Vision problems as well as examples of their successful commercialisation. (Selected students: 150/396.)

February, 2015 - October, 2015 **Research Fellow @ iCub Facility (Istituto Italiano di Tecnologia)**, *6D object tactile localization for the humanoid robot iCub*, Istituto Italiano di Tecnologia & Universita' di Firenze, Genova, Italy.
I have partnered with the Italian Institute of Technology during my M.Sc. thesis.

July, 2015 **The iCub Summer School - Veni Vidi Vici 2015**, Sestri Levante, Italy.
The school focuses on humanoid robotics, with the goal to foster collaboration on robot software across the boundaries and lifetimes of specific platforms and projects.

December, 2013 **52th IEEE Conference on Decision and Control**, *Crew Member*, Florence, Italy.
The CDC is recognized as the premier scientific and engineering conference dedicated to the advancement of the theory and practice of systems and control.

Submitted Papers

November, 2016 **A Novel Bayesian Filtering Approach to Tactile Object Recognition**, *G. Vezzani, N. Jamali , U. Pattacini , G. Battistelli, L. Chisci, and L. Natale*, IEEE International Conference on Humanoid Robotics, pp. 256 - 263, Cancun, Mexico.

2017 **Memory unscented particle filter for 6-DOF tactile localization**, *G. Vezzani, U. Pattacini, G. Battistelli, L. Chisci, and L. Natale*, accepted to IEEE Transaction on Robotics, preprint available atarXiv:1607.02757.

May-June, 2017 **A Grasping Approach Based on Superquadric Models**, *G. Vezzani, U. Pattacini, and L. Natale*, accepted at IEEE International Conference on Robotics and Automation, Singapore.

Awards

February, 2017 **RAS Travel Grant**, *at IEEE International Conference on Robotics and Automation (ICRA)*, Singapore.

November, 2016 **Dr. Kanako Miura Travel Support Award**, *at IEEE International Conference on Humanoids Robotics*, Cancun, Mexico.

March, 2016 **AEIT Renato Marian Award**, *as best student graduated in Information Engineering*, Florence, Italy.

Engineering License

January, 2016 **Professional Practical Examination in Industrial Engineering (qualified)**, *Universita' degli Studi di Firenze*, Florence, Italy.

Education

September, 2013 - October, 2015 **M. Sc. with honours in Electrical and Automation Engineering (GPA 4.0/4.0)**, *Università degli Studi di Firenze*, Florence, Italy.

M. Sc. thesis "6D tactile localization for the humanoid robot iCub":
The goal of the 6D object tactile localization problem is to estimate the 6-DOF pose of a tridimensional object, whose model is known (for example as a mesh model). This aim is successfully achieved with the design and implementation of an innovative filtering algorithm, the Memory Unscented Particle Filter. Such an algorithm has been tested with real objects and by using both simulated and real measurements, collected by the iCub, turning out to be a competetive algorithm with the state of art. The results have been summarized in the regular paper "Memory Unscented Particle Filter for 6-DOF Tactile Localization," accepted at the international journal IEEE Transaction on Robotics. The C++ implementation of the algorithm can be downloaded from the github repository: tactile-localization

M. Sc. Projects:
- "Modeling and control of a LEGO Legway", consisting of the design and implementation of control and estimation algorithms for stabilization, trajectory tracking and remote control of a two-wheeled inverted pendulum, realized with LEGO Mindstorm platform.
- "Comparison between two different algorithms of distributed filtering and smoothing for nonlinear systems", dealing with the comparison between two particular solutions for the problem of distributed state estimation of a nonlinear system by exploiting measurements coming from a sensor network, and the extension of two state-of-art algorithms to nonlinear and smoothing filtering problem.

September, 2010 - July, 2013 **B. Sc. with honours in Electronic and Telecommunications Engineering (GPA 3.96/4.0)**, *Università degli Studi di Firenze*, Florence, Italy.

B. Sc. thesis "Trajectory planning and control of an anthropomorphic robot for pick and place operations":
The goal of the project is to introduce, in an assembly line of an Italian firm, an anthropomorphic robot to optimize the production. A kinematic study is realized in order to design a good trajectory to accomplish the desired task. Then, in order to get more realistic simulations and results, a dynamic study is implemented with the MATLAB tool SimMechanics.

B. Sc. projects:
- Reliability and Failure rate estimation of an electronic board, wherein failure rate of an electronic board is calculated, at first, by using the Part Count method, and then, to provide a better analysis, by using the Part Stress method, described in Military Handbook 217.

2005 - 2010 **Scientific high school Diploma with full marks**, *Liceo Scientifico Guido Castelnuovo*, Florence, Italy.

.

Skills

Software **Programming**, C++, Python, MATLAB, OpenCV, CGAL, Meshlab, Yarp, IPOPT, Lua, CMake.

OS, Windows, Linux.

Versioning Systems, Git.

Hardware **Robots** & **Platforms**, iCub, LEGO Mindstorms.

Languages

Italian, mother tongue.

English, very good English speaking and interaction skills, excellent reading skills, everyday training with collegues from all over the world.

Interests and Hobbies

Music I have been playing the piano since I was a child. I used to perform in public twice per year, in different theatres in **Florence** and in **Lugano** (Switzerland). I love going to the theatre to listen to piano concerts and classical opera.

Music awards **Exams on Piano and Solfeggio**, *Istituto Superiore di Studi Musicali Rinaldo Franci*, Siena, Italy.

Competition, *XII Concorso Pianistico Nazionale "Giulio Rospigliosi", March 2005*, 4th award, Lamporecchio, Italy.

Competition, *XIII Concorso Pianistico Nazionale "Giulio Rospigliosi", April 2006*, 4th award, Lamporecchio, Italy.

Sport Running, dancing, skiing, snorkeling.

Art I like going to visiting exhibitions. In particular, I am very keen on **contemporary** and **scientific** exhibitions.