

Alessandra PACILLI

PFOFILE

Licensed industrial Engineer, PhD in Sciences Technologies and Measures for Space in April 2014. Strong know-how in rehabilitation robotics, biomechanics and mechanical measurements. In my work as well as in my personal life, I love to go beyond my own limits and to seek solutions to everyday issues. I like challenging situations and responsibilities.

EDUCATION and RESEARCH

Fulbright BEST Scholar (Business Exchange and Student Training)

Santa Clara University, CA, 2014-2015

Educational experience on Technology entrepreneurship.

PhD in Sciences Technologies and Measures for Space

University of Padua, 2010-2014;

Research fellow at Department of Mechanical and Aerospace Engineering

"Sapienza" University of Rome, 2012-2014.

PhD project

I have designed and realized a planar robot for postural rehabilitation of stroke patients, which is capable of interacting with the subject standing upon it. I have sensorized the device and developed the control software.

More details and the list of publications are in the attached appendix to this CV.

Further activities

I have analyzed perturbed walking in pediatric patients with hemiplegia.

I have also led seminars, conducted laboratory demonstrations and supervised trainee and students from Mechanical and Biomedical Engineering School.

Research fellow at H2CU (Honors Center for Italian Universities)

"Sapienza" University of Rome, 2010-2011.

Main activities

Evaluation of age-related differences in upper arm movements using a rehabilitation robot and an optoelectronic system.

Experimental characterization of a novel exoskeleton for walking rehabilitation.

Master of Science, Biomedical Engineering (with honors)

"Sapienza" University of Rome, 2007-2009.

Bachelor of Science, Clinical Engineering, GPA: 105/110

"Sapienza" University of Rome, 2003-2006.

PROFESSIONAL EXPERIENCE and TEACHING

R&D Intern

ExploraMed - Mountain View (CA, US), November 2014- February 2015.

Main activities

Product development for a large consumer medical device.

Clinical trials, Q&A, data analysis and modelization of human biological system.

Biomedical Engineer at MARLAB (Movement Analysis and Robotic Laboratory)

Children's Hospital "Bambino Gesù", Palidoro and Santa Marinella - Rome, 2011-2012.

Main activities

Optimization of a novel robot for walking therapy and its introduction in clinical routine.

Characterization of a powered exoskeleton for pediatric paraplegic subjects.

Tutor in Mechanical and Thermal Measurements for Mechanical and Biomedical Engineering
"Sapienza" University of Rome, a.a. 2011/12.

Main activities

Conduction of seminars and organization of the related teaching material. Realization of measurement chains for mechanical and thermal sensors and transducers; data acquisition and processing.

Lecturer at post-degree course MACOPS (Management & coordination of health professions)
LUM University - Jean Monnet, School of Management - Bari, a.a. 2011/12 e 2012/13.

Main activity

Video-lectures on Digital public-health as a leverage mechanism to create value and to improve healthcare quality and accessibility.

CONTINUING EDUCATION and AWARDS

Certifications

Test Of English as Foreign Language (*TOEFL*) - ETS, April, 2014. Grade: 103/120
Certified Labview Associate Developer (CLAD) - National Instruments, April, 2014.

Courses attended

Business Entrepreneurship Student Training program - Santa Clara University, CA(USA), 2014.
Corporate finance and business management - Ordine degli Ingegneri di Roma, 2014.
LabVIEW Core3, Data acquisition, Core 2, Core 1 - National Instruments Italy, 2012-2013.
English for Business & Professionals - PACE University, New York, NY USA, 2011.

Awards

Scholarship H2CU: free accommodation in Manhattan, New York, NY USA, 2011.

INTERESTS and SKILLS

Further technical skills

Deep knowledge of Matlab, SolidWorks, Labview, MS Office suite, MS Visio.
Installation and management of laboratory instruments, inertial sensors, induction motors, ADC boards; realization of simple electronic circuits; 3D printing.
Good knowledge of CANbus and CANopen protocol.
General research skills; organization of clinical studies from the experimental setup to the statistical design; data fusion techniques.
Knowledge and use of a wide range of biomedical instruments (oximeters, metabolic oxygen consumption monitors, pressure map, EMG, footswitches, electrogoniometers etc.)

Personal skills

Productive interaction with diverse professionals (healthcare workers, technical experts); public speaking capacities and audience involvement; practical training for groups of people.
Team working and leadership abilities acquired through life experience.
Entrepreneurial spirit, listening ability and critical thought. Steep learning curve.
Full clean driving license.

Languages

Italian: native speaker.
English: B1 speaking, listening, writing and reading. TOEFL: 103/120
French: basic.

Interests

Film forum; reading; hiking; scout leader; active citizenship; guerrilla gardening.

Rome, 14th April 2015

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APPENDIX

PhD PROJECT

Thesis title

Robotic postural rehabilitation in Pediatrics. Design, development, control system implementation and sensorization of a rehabilitation robot.

Supervisor

Prof. Paolo CAPPÀ ("Sapienza", University of Rome).

Abstract

The ability to maintain postural control is a complex task and, although it is natural for healthy subjects, it is often disrupted in stroke patients.

It has been demonstrated that the CNS is able to reorganize itself, even after a cerebrovascular accident; and, the more interactive and challenging the therapy is, the more rapid and effective the recovery is.

On this basis, I designed and realized a Cartesian robot for postural rehabilitation of pediatric stroke patients, consisting in a motorized platform with 2 degrees of freedom and a low profile design, so that it could be installed, in the future, below the floor. Each of the two induction linear motors has been sensorized with a load cell, in order to "feel" the forces imposed by the subject standing upon it.

The greatest challenge was to make the platform a real haptic interface, i.e. able to produce actions in response to the external forces imposed by the patient; therefore I used, for both motors, the speed control mode; in addition, a superior control loop was imposed to simulate a 2DOFs spring, placed in parallel with a damper of coefficient C.

For security purposes and to ensure evolvability and modularity, the software architecture I developed in LabVIEW using the CANopen protocol was articulated on three different levels.

The platform will be tested, during the next months, with healthy subjects, before its introduction in clinical routine.

PUBLICATIONS

Papers (P) and conference proceedings (CP)

PACILLI, ROSSI, PATANÈ, CASTELLI, CAPPÀ, PETRARCA (2014) - *Effects of floor perturbations on gait kinematics of healthy children and children with hemiplegia*. Congresso SIAMOC – ESMAC 2014. (CP)

ANCILLAO, PATANÈ, ROSSI, PACILLI, CAPPÀ (2014) - *Optoelectronic quality assesment of strength measurements by hand held dynamometer*. Congresso SIAMOC – ESMAC 2014. (CP)

PACILLI, GERMANOTTA, ROSSI, CAPPÀ (2014) - *Quantification of age-related differences in reaching and circle drawing utilizing a rehabilitation robotic device*. Articolo sottomesso alla rivista *Applied Bionics and Biomechanics*. (P)

ANCILLAO, PATANÈ, ROSSI, PACILLI, CAPPÀ (2014) - *Lower limb strength measurements by Hand Held Dynamometer assisted by optoelectronic system*. Congresso di Misure Meccaniche e Termiche 2014. (CP)

PACILLI, PATANÈ, ROSSI, CAPPÀ (2014) - *Development of a robotic platform for pediatric postural rehabilitation*. 3° Congresso nazionale del Coordinamento della Meccanica Italiana. (CP)

PACILLI, GERMANOTTA, ROSSI, PETRARCA, CASTELLI, CAPPÀ (2013) - *Differences between children and adults in upper limb motor control during the execution of typical robotic rehabilitation tasks*. *Gait & Posture*, 38, S81. (CP)

GERMANOTTA, PACILLI, ROSSI, PETRARCA, CASTELLI, CAPPÀ (2013) - *Modification of upper limb performance with and without visual feedback in a patient with cerebral palsy: a case study*. *Gait & Posture*, 38, S81. (CP)

PACILLI, GERMANOTTA, ROSSI, PETRARCA, CASTELLI, CAPPÀ (2012) - *Experimental protocol for the study of upper limb kinetics in robot rehabilitation*. *Gait & Posture*, 35, S1. (CP)

Poster

COLAZZA, PETRARCA, PACILLI, RICCIOLI, MANDAGLIO, CORDONE, MERONI, CAPPÀ, CASTELLI - Evaluation of the Sarà robotic system training on children with Cerebral Palsy. Congresso SIAMOC 2013