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Ilaria Fagioli

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ABOUT ME

I am a PhD student at the Wearable Robotics Laboratory in The BioRobotics Institute, Scuola Superiore Sant'Anna. My research mainly focuses on the development of robotic transfemoral prostheses and their validation through tests with end-users.

WORK EXPERIENCE

01/10/2021 – CURRENT

PHD STUDENT IN BIOROBOTICS SCUOLA SUPERIORE SANT'ANNA

Mainly working in the framework of the PR19-PAI-P2 - MOTU++ project. Involved in the following activities:

- Design, control, and validation of robotic lower-limb prostheses.
- Design of experimental protocols and conduction of clinical trials with end-users.
- Coordination and management of the project (internal communications, minutes and project's deliverables drafting, platforms' certification as class IIA medical devices, submissions to the ethics committee).

EDUCATION AND TRAINING

11/2019 – 09/2021 Pisa, Italy

M.SC. IN BIONIC ENGINEERING University of Pisa & Scuola Superiore Sant'Anna

- Development of a middle-level controller and an segmentation algorithm for an underactuated prosthesis.
- Tests on the bench.
- Tests on a healthy subject.

Final grade 110/110 cum laude |

Thesis Study and experimental verification of an underactuated design for an active transfemoral prosthesis

10/2019 – 12/2022 Pisa, Italy

II LEVEL MASTER DEGREE FROM SCUOLA SUPERIORE SANT'ANNA IN INFORMATION ENGINEERING Scuola Superiore Sant'Anna

- Development of a dynamic model to estimate the current consumption of a robotic underactuated prosthesis.
- Verification of the model's estimates through tests on the bench.

Final grade 100/100 cum laude |

Thesis Dynamic modelling of an underactuated design for an active transfemoral prosthesis

09/2016 – 09/2019 Perugia, Italy

B.SC. IN ELECTRONIC ENGINEERING University of Perugia

- Specifications definition for an embedded filter tunable in the microwave frequencies.
- CAD model and electromagnetic simulations of different microstrip filter designs.

Final grade 110/110 cum laude | **Thesis** Design of a SiP filter tunable in the Ka bandwidth for 5G applications

09/2011 – 06/2016

SCIENTIFIC HIGH SCHOOL DIPLOMA Liceo Scientifico Statale Galileo Galilei Perugia

Final grade 100/100

DIGITAL SKILLS

Microsoft Powerpoint | NI labVIEW | Matlab | Java | C/C# | LaTex | Simulink | Microsoft Office | MPLABx Embedded C programming

LANGUAGE SKILLS

Mother tongue(s): **ITALIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C1	C1	C1	C1	C1
FRENCH	A2	A2	A2	A2	A2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

ADDITIONAL INFORMATION

PUBLICATIONS

Looking for synergies in healthy upper limb motion: a focus on the wrist – 2023

F. Masiero*, I. Fagioli*, L. Truppa, A. Mannini, L. Cappello and M. Controzzi, "Looking for Synergies in Healthy Upper Limb Motion: A Focus on the Wrist," in IEEE Transactions on Neural Systems and Rehabilitation Engineering, vol. 31, pp. 1248-1257, 2023, doi:10.1109/TNSRE.2023.3243785.

A Model-Based Framework for the Selection of Mechatronic Components of Wearable Robots: Preliminary Design of an Active Ankle-Foot Prosthesis

– 2022

Mazzarini, A.*, Fagioli, I.*, Trigili, E., Fiumalbi, T., Capitani, S., Peperoni, E., ... & Vitiello, N. (2022, July). A Model-Based Framework for the Selection of Mechatronic Components of Wearable Robots: Preliminary Design of an Active Ankle-Foot Prosthesis. In Computers Helping People with Special Needs: 18th International Conference, ICCHP-AAATE 2022, Lecco, Italy, July 11–15, 2022, Proceedings, Part II (pp. 453-460).

CONFERENCES AND SEMINARS

14/02/2023 – 15/02/2023 – Gronigen, the Netherlands

MyLeg Winter School 2023 In-person attendance and poster presentation regarding the mechatronic design and prototype of a robotic prosthesis.

07/08/2022 – 10/08/2022 – Oxford, United Kindgdom

Oxford ML Summer School 2022 In-person attendance to the courses and workshops, which included advanced topics in ML theory and its application s in healthcare and medicine.

10/10/2022 – Milano, Italy

Seminar at Humanitas University - I Level Master in Advanced Technologies in Rehabilitation Held a seminar and a workshop on active lower-limb prostheses.

12/07/2022 – 15/07/2022 – Lecco, Italy
International Conference on Digital Inclusion, Assistive Technology & Accessibility (ICCHP-AAATE) 2022 In-person attendance to the conference.

04/03/2015 – 07/03/2015 – New York, USA
High School Model United Nations NY Educational simulation program wherein I assumed the roles of a delegate representing a country within simulated United Nations conferences. Immersive experience where I started developing my knowledge of diplomacy and problem-solving skills.

PROJECTS

12/2020 – 04/2021
Traineeship - Artificial Hands Area Carried out as a part of the M.Sc. in Bionic Engineering.
- Used inferential statistics and factor analysis to analyze biomechanical data acquired through a motion capture system (VICON).
- Extracted information regarding the postural synergies of the wrist joint during reaching and manipulation tasks.

12/2020 – 02/2021
Prosthetic Hand Control Carried out as part of the M.Sc. in Bionic Engineering.
- Programmed a PIC18 microcontroller to acquire EMG signals from commercial electrodes on a subject's arm and used them for the control of the IH2 Azzurra prosthetic hand.

03/2020 – 10/2020
Wearable Technologies Laboratory Carried out as part of the II Level Master at Scuola Superiore Sant'Anna. The obectives of the project were the design and implementation of a software module for the management of brakes in the transfemoral prosthesis.
- Developed a simulator and preliminary verification.
- Implemented RT and benchtested on the prosthesis.

12/2019 – 02/2020
Neuromorphic Engineering Carried out as part of the M.Sc. in Bionic Engineering.
- Encoded position and velocity of a vibro-tactile piezo-actuated haptic glove through a spiking neuron model (Izhikevic) on LabVIEW.
- Implemented K-NN classification of geometric shapes performed by a user wearing the haptic glove.

02/2022 – 05/2022
High-tech Entrepreneurship Carried out as part of the PhD in Biorobotics.
- Developed and presented the business model and the business plan of an innovative start-up.

HONOURS AND AWARDS

2022
GNB Thesis Award 2022 – Italian National Bioengineering Group

2021
PhD in Biorobotics - Fully-funded scholarship – Scuola Superiore Sant'Anna

2019
Scuola Superiore Sant'Anna Alumnus - Full residential scholarsip – Scuola Superiore Sant'Anna

MANAGEMENT AND LEADERSHIP SKILLS

Project planning and execution During my experience as both an undergraduate and a PhD student, I have honed skills in adapting to changing circumstances, prioritizing tasks, and closely monitoring progress to ensure efficient project delivery and successful outcomes.
Specifically, during my PhD, I engaged in the following activities:
- Coordinating team meetings and preparing necessary materials.
- Managing the activities to certificate the platforms developed within the project as class IIA medical devices.
- Managing the activities to draft an experimental protocol and to submit it to an ethical committee.
- Reviewing and revising of project deliverables.

Teamwork During my academic career I had the chance to develop strong collaboration skills by working on several group projects, often with people coming from different academic backgrounds.

DRIVING LICENCE

Driving Licence: B