

Leonardo Pollina

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Education

<p>Ph.D. EPFL, Lausanne, Switzerland Electrical Engineering (Neural Engineering)</p> <ul style="list-style-type: none"> • Topic: Investigating free, imagined, and observed actions to develop human- and brain-machine interfaces for motor enhancement. • Thesis advisors: Prof. Silvestro Micera, Prof. Solaiman Shokur 	Feb 2022 – Ongoing
<p>Harvard Medical School, Boston, MA, USA Computational Neuroscience</p> <ul style="list-style-type: none"> • Host: Prof. Gabriel Kreiman • Visiting Ph.D. student 	Aug 2022 – Dec 2022 Jun 2023 - Dec 2023
<p>M.Sc. EPFL, Lausanne, Switzerland Life Sciences Engineering (specialized in Neuroscience and Neural engineering)</p> <ul style="list-style-type: none"> • GPA: 5.76/6.0 	Sep 2018 – Mar 2021
<p>B.Sc. EPFL, Lausanne, Switzerland Life Sciences Engineering</p> <ul style="list-style-type: none"> • GPA: 5.25/6.0 	Sep 2015 – May 2018
<p>Aalto University, Espoo, Finland Biomedical Engineering</p> <ul style="list-style-type: none"> • Academic exchange during 3rd year of bachelor 	Sep 2017 – May 2018

Experience

<p>Scuola Superiore Sant'Anna, Research Assistant</p> <ul style="list-style-type: none"> • Topic: Decoding physiological challenges (increases of heart rate or respiration rate) from vagus nerve's activity recorded with intraneural electrodes in pigs. 	Pisa, Italy Aug 2021 – Jan 2022
<p>Harvard Medical School, Graduate Student Intern</p> <ul style="list-style-type: none"> • Topic: Combining neurophysiology and computational modeling to investigate top-down visual task dependence. 	Boston, MA, USA Mar 2020 – Mar 2021
<p>EPFL, Graduate Student Intern</p> <ul style="list-style-type: none"> • Topic: Building and validating deep learning models to predict the movement of each finger independently. 	Geneva, Switzerland Sep 2019 – Feb 2020
<p>Vision Institute, Research Engineer Intern</p> <ul style="list-style-type: none"> • Topic: Spectral analysis of EEG data recorded in a divided visual attention task in young and elderly subjects. 	Paris, France Jun 2018 – Sep 2018

Publications

* indicates equal contribution.

"Integrating multimodal control strategies for unobtrusive motor augmentation", *In preparation* 2025

L. Pollina*, DL. Pinheiro*, A. Pero, H. Lin, S. Shokur, S. Micera

"Task-dependent top-down modulation enables flexible rerouting of sensory information in the human visual cortex", ***In preparation*** 2025
L. Pollina*, A. Cometa*, W. Lotter, J. Olson, JR. Madsen, G. Kreiman

"Decoupling simultaneous motor imagination and execution via orthogonal ECoG neural representations", ***Under review*** at Nature Communications 2025
L. Pollina, L. Struber, V. de Seta, E. Russo, S. Karakas, S. Chabardès, T. Aksenova, G. Charvet, S. Shokur, S. Micera

"On the neural correlates of motor imagery with an extra virtual arm", ***Under review*** at IEEE Transactions on Medical Robotics and Bionics 2025
DL. Pinheiro*, **L. Pollina***, KA. Buetler, L. Marchal-Crespo, S. Shokur, S. Micera

"Decoding lower limb motor attempts from EEG signals in a spinal cord injury patient with epidural electrical implant", International Conference on NeuroRehabilitation (ICNR) 2024
[L. Toni](#), V. de Seta, S. Romeni, V. Mendez, **L. Pollina**, D. Emedoli, L. Albano S. Iannaccone, P. Mortini, S. Micera

"Human motor augmentation with an extra robotic arm without functional interference", Science Robotics [L. Pollina](#) 2023
G. Dominijanni, DL. Pinheiro*, **L. Pollina***, B. Orset, M. Gini E. Anselmino, C. Pierella, J. Olivier, S. Shokur, S. Micera

"Decoding bladder state from pudendal intraneural signals in pigs", APL Bioengineering [L. Pollina](#) 2023
A. Giannotti, S. Lo Vecchio, S. Musco, **L. Pollina**, F. Vallone, I. Strauss, V. Paggi, F. Bernini, K. Gabisonia, L. Carlucci, C. Lenzi, A. Pirone, E. Giannessi, V. Miragliotta, S. Lacour, G. Del Popolo, S. Moccia, S. Micera

"A lightweight learning-based decoding algorithm for intraneural vagus nerve activity classification in pigs", Journal of Neural Engineering [L. Pollina](#) 2022
L. Pollina*, F. Vallone*, MM. Ottaviani, I. Strauss, FA. Recchia, S. Moccia, S. Micera

"Deep learning with convolutional neural network for proportional control of finger movements from surface EMG recordings", 10th International IEEE/EMBS Conference on Neural Engineering (NER) [L. Pollina](#) 2021
V. Mendez, **L. Pollina**, F. Artoni, S. Micera

Talks

(Poster) "Distinct yet overlapping neural spaces explain local field potentials activity in motor execution and imagination", Society for Neuroscience (SfN) annual meeting, Chicago 2024
L. Pollina, L. Struber, V. de Seta, S. Karakas, J. Faber, S. Chabardès, T. Aksenova, G. Charvet, S. Shokur, S. Micera

(Poster) "Assessment of a diaphragmatic respiration-based control strategy for Extra Robotic Limbs", Society for Neuroscience (SfN) annual meeting, San Diego 2022
L. Pollina, G. Dominijanni, DL. Pinheiro, M. Gini, G. Gamberini, C. Pierella, J. Olivier, S. Shokur, S. Micera

(Oral presentation) "A fast and accurate learning-based decoding algorithm for the classification of cardiovascular and respiratory challenges using intraneural electrodes in the pig vagus nerve", 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC) [L. Pollina](#) 2022
L. Pollina*, F. Vallone*, MM. Ottaviani, I. Strauss, F. A Recchia, S. Moccia, S. Micera

(Poster) "Task-dependent routing of visual information", Society for Neuroscience (SfN) annual meeting, Online 2021

Awards

Trainee and Professional Development Award , Society for Neuroscience	2024
To recognize undergraduate and graduate students, as well as postdoctoral scholars, who demonstrate scientific merit and excellence in research, providing them with the opportunity to present their work at the annual meeting.	
Nova 111 List Italy 2023 - Category: Public Service, Research and Education , Nova Italy	2023
The list identifies the best 10 talents under 35 who have achieved outstanding results and a driving positive impact.	
Teaching Assistant award for Translational Neuroengineering , EPFL	2022
The Teaching Assistant Award is an initiative of the School of Engineering to reward the extraordinary contribution of PhD students to supervising student exercise sessions and practicals.	
Third Best Master's GPA in Life Sciences Engineering , EPFL	2021
To reward the student with the third average grade in the Master's degree in Life Sciences Engineering.	
Bertarelli Fellowship in Translational Neuroscience and Neuroengineering , EPFL	2019
A competitive fellowship (5 students/year) granting the opportunity to carry out the Master's thesis within a laboratory affiliated to Harvard Medical School.	

Teaching & Mentorship

Students supervision	2022 - Ongoing
Definition of the project, weekly supervision, provide feedback on written and oral deliverables, grading.	
<ul style="list-style-type: none">• 4 students for Master's thesis: He-Shan Lin, Alessandra Pero, Francesca Virgolini, Caya Dreessen• 11 students for Semester projects: Emma Farina, Thibaut Stoltz, Tobiad Bodenmann, Elena Gado, Marwan Haioun, Clara Rossignol, Sarah Mikami, Niccolò Venturini degli Espositi, Yi-Chen Pai, Nicolas Francio, Ismail Filali	
Teaching Assistant	Spring semesters 2022-2025
In charge of preparing exercise sessions for students, supervision of projects, journal club, grading, exam preparation.	
<ul style="list-style-type: none">• Translational Neuroengineering, EPFL (Prof. Silvestro Micera, Prof. Friedhelm Hummel).	
Student Assistant	
In charge of helping students during exercise sessions.	
<ul style="list-style-type: none">• Probabilities and Statistics I&II, EPFL (Prof. Darlene Goldstein).• Advanced General Chemistry, EPFL (Prof. Samuel Terrettaz).	

Leadership, Service & Outreach

Ph.D. Student representative for the doctoral school of electrical engineering (EDEE) at EPFL	2024 - Ongoing
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- Served as the link between Ph.D. students and the doctoral program, assisting with coursework development, student integration, event organization, and creating communication channels to foster community.
- Collaborating with representatives from other doctoral schools to address and mitigate issues at the university level such as teaching duties, work-life balance, and systemic challenges in academia.

Exhibition "The augmented human", Le Rosey Boarding School, Rolle, Switzerland

Fall 2024

- Participated in the exhibition to showcase our lab's work on human motor augmentation through the control of a robotic third arm.

EPFL representative

Shared my academic journey in Life Sciences Engineering with students to assist them in choosing their undergraduate studies.

- Calvin High-school, Geneva, Switzerland
- EPFL Open Days, Lausanne, Switzerland

Fall 2024

Fall 2021

Languages

Italian: Native language

English: Full professional proficiency

French: Full professional proficiency