



JOHNS HOPKINS
BIOMEDICAL ENGINEERING

BME SPECIAL SEMINAR

Giacomo Valle, PhD

Postdoctoral Fellow
University of Chicago

Tuesday, March 28, 2023

10:00am-11:00am

Clark Hall 110 and via zoom:

<https://bit.ly/40pl71o>

Faculty Host: Sri Sarma



Neurotechnologies for human-machine interfacing

Abstract: In the recent past, research interest has been directed towards studying the fascinating field of connecting the human nervous system with bionic limbs. Striving to close the gap between humans and machines, this research is now working to create robotic devices that utilize the direct neural stimulation of the nervous system to restore sensory-motor functions lost after an injury or a disease. Decades of technological developments have populated the field of brain-machine interfaces (BMI) and neuroprosthetics with several replacement strategies, neural modulation treatments, and rehabilitation strategies to improve the patients' quality of life. The neuroprostheses are implantable devices designed to replace or improve the function of a disabled part of the nervous system. Novel approaches for the development of a biomimetic bidirectional interfacing with the human brain will be presented. The neuroprosthetic field is now quickly expanding thanks to advances in neural interfaces, machine learning techniques, and robotics. In the next future, the neurotechnologies will continue to grow thanks also to faster and more advanced computer simulations allowing to test and validate these technologies even faster. The transformation of neurotechnologies blurs the boundaries between human and machine.

Bio: Dr. Giacomo Valle received B.S. and M.S. in Biomedical Engineering in 2014 and 2016 respectively from the University of Genoa, Italy. He then received a Ph.D in Biorobotics (cum Laude) from the The Biorobotics Institute, Scuola Superiore Sant'Anna (Pisa, Italy) in collaboration with EPFL Lausanne. Starting from 2019, Dr. Valle worked as a Postdoctoral researcher in the Neuroengineering Lab at ETH Zurich (CH) where he also completed an MBA in Bio-Entrepreneurship at the University of Bern in 2022. Dr. Valle is now a Postdoctoral Fellow at University of Chicago in the Bensmaia Lab working in the field of human intracortical BCI. Dr. Valle won prestigious international awards, such as the BRIDGE Proof of Concept 2020 by Swiss National Science Foundation, the Sir Henry Royce Medal 2021 by the Institution of Engineering and Technology, the FENS EJN Young Investigator Prize 2022 by the Federation of European Neuroscience Societies (FENS) and the Misha Mahowald Prize for Neuromorphic Engineering 2021. Dr. Valle is also a co-founder of MYLEG, a medtech startup that raised more than a million USD in investments. Dr. Valle is currently working to create a connection between the human nervous system and bionic limbs, aiming to close the gap between humans and machines.