About the ReNeT Lab
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ReNeT Lab (Rehabilitation, Neuroscience & Technology Laboratory, ReNeT lab: https://www.neuroscienze.unipd.it/renetlab) is part of the Neuroscience Department of the University of Padova and the Padova Neuroscience Center. It has a strong collaboration, through the Neurorobotics joint Lab, with the Intelligent Autonomous Systems Lab of the Department of Information Engineering of the University of Padova.

ReNeT Lab is a multidisciplinary lab focused on restoring motor functions after lesions of the Central Nervous System by envisioning a paradigm change of rehabilitation.

ReNeT Lab mission is to develop innovative rehabilitation treatments based on individual neurobiological & neurophysiological fingerprints of recovery (i.e. neurorobotics, neurostimulation). The lab is coordinated by Pro. Alessandra Del Felice and presently involves 1 post-doc, 4 PhD students, plus neurology/neurophysiology residents and master students.

Skills available at ReNeT Lab include neurophysiology, neurorehabilitation, robotic rehabilitation, advanced EEG and EMG signal analysis, neuropsychology, and clinical motion analysis with wearable sensors.

The equipment available at the ReNeT-Lab includes several lower limb exoskeletons, a High Density EEG (128 and 256 channels), a wireless 64 channels EEG system, a full body IMUs suit including inertial gloves for motor tracking and motion analysis, a transcranial magnetic Stimulation system (TMS), and a wireless EMG system. The Neurology Clinic of the University Hospital of Padova provides incomparable access to diverse neurological patient populations.

Selected Publications of the ReNeT Lab
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Buccellato A, Çatal Y, Bisiacchi P, Zang D, Zilio F, Wang Z, Qi Z, Zheng R, Xu Z, Wu X, Del Felice A, Mao Y, Northoff G. Probing Intrinsic Neural Timescales in EEG with an Information-Theory Inspired Approach: Permutation Entropy Time Delay Estimation (PE-TD). Entropy (Basel). 2023 Jul 19;25(7):1086. doi: 10.3390/e25071086.

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Rubega M, Facca M, Curci V, Sparacino G, Molteni F, Guanziroli E, Masiero S, Formaggio E, Del Felice A. EEG Microstates as a Signature of Hemispheric Lateralization in Stroke. Brain Topogr. 2023 May 17;1–4. doi: 10.1007/s10548-023-00967-8.

Rubega M, Ciringione L, Bertuccelli M, Paramento M, Sparacino G, Vianello A, Masiero S, Vallesi A, Formaggio E, Del Felice A. High-density EEG sleep correlates of cognitive and affective impairment at 12-month follow-up after COVID-19. Clin Neurophysiol. 2022 Aug;140:126-135. doi: 10.1016/j.clinph.2022.05.017

Bisi MC, Di Marco R, Ragona F, Darra F, Vecchi M, Masiero S, Del Felice A, Stagni R. Quantitative Characterization of Motor Control during Gait in Dravet Syndrome Using Wearable Sensors: A Preliminary Study. Sensors (Basel). 2022 Mar 10;22(6):2140. doi: 10.3390/s22062140.

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Rubega M, Formaggio E, Molteni F, Guanziroli E, Di Marco R, Baracchini C, Ermani M, Ward NS, Masiero S, Del Felice A. EEG Fractal Analysis Reflects Brain Impairment after Stroke. Entropy (Basel). 2021 May 11;23(5):592. doi: 10.3390/e23050592.

Molteni F, Formaggio E, Bosco A, Guanziroli E, Piccione F, Masiero S, Del Felice A. Brain Connectivity Modulation After Exoskeleton-Assisted Gait in Chronic Hemiplegic Stroke Survivors: A Pilot Study. Am J Phys Med Rehabil. 2020 Aug;99(8):694-700. doi: 10.1097/PHM.0000000000001395.

Di Marco R, Hallemans A, Bellon G, Ragona F, Piazza E, Granata T, Ceulemans B, Schoonjans AS, Van de Walle P, Darra F, Dalla Bernardina B, Vecchi M, Sawacha Z, Scarpa B, Masiero S, Benedetti MG, Del Felice A. Gait abnormalities in people with Dravet syndrome: A cross-sectional multi-center study. Eur J Paediatr Neurol. 2019 Nov;23(6):808-818. doi: 10.1016/j.ejpn.2019.09.010.

Links
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University of Padua: https://youtu.be/Zl6vKRe6PWc; https://www.unipd.it/en/
City of Padua: https://youtu.be/gvSwH8yFupw; https://en.wikipedia.org/wiki/Padua
Living in Padua: https://www.unipd.it/en/course/living-padua