

Saeed Makkinayeri, Ph.D.

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📄 Saeed Makkinayeri



Research Experience

- 2024 – present **Postdoctoral Researcher** University of Chieti-Pescara, Italy.
Funding: ERC Synergy Grant (ERC-SyG 2018) “Connect-To-Brain”. Principal Investigators: Prof. Gian Luca Romani, Prof. Ulf Ziemann, Prof. Risto Ilmoniemi.
– Exploring large-scale brain network and its dynamics derived by TMS in TMS-EEG data.
– Applying probabilistic models (e.g., Hidden Markov Models) and deep learning models (e.g., LSTMs) for brain-state identification and tracking.
– Contributing to closed-loop and control-theoretic approaches for adaptive neurostimulation.
- 2021 – 2024 **PhD Candidate** University of Chieti-Pescara, Italy.
Funding: ERC Synergy Grant (ERC-SyG 2018) “Connect-To-Brain”.
– Investigated large-scale brain network dynamics in prestimulus EEG-TMS data.
– Studied state-dependent neuromodulation, focusing on how ongoing brain activity modulates responsiveness to transcranial magnetic stimulation (TMS).
– Performed advanced EEG and TMS-EEG signal processing, including artifact removal, time-frequency analysis, and connectivity estimation.
- 2019 – 2020 **Researcher**, Kerman University of Medical Sciences, Iran.
Conducted domain adaptation algorithms to improve generalization across subjects, sessions, and recording conditions in EEG data.
- 2017 – 2019 **Researcher**, Pooyandegan Rah Saadat Co., Iran.
– Developed software packages for ECG monitoring devices.
– Implemented advanced digital filtering, heart rate variability analysis, and arrhythmia detection/classification algorithms.
- 2015 – 2017 **Researcher** at Aja University of Medical Sciences, Iran.
Designed and manufactured a cardiopulmonary resuscitation (CPR) device.

Education

- 2021 – 2024 **Ph.D. in Neuroscience**, University of Chieti-Pescara, Chieti, Italy.
Thesis: Models for the study of brain connectivity modulations induced by neurostimulation.
Supervisor: Prof. Laura Marzetti and Prof. Vittorio Pizzella.
- 2013 – 2015 **M.Sc. in Biomedical Engineering (Bioelectric)**, Iran University of Science and Technology, Tehran, Iran.
Thesis: Closed-loop control of bladder voiding using functional electrical stimulation.
Supervisor: Prof. Abbas Erfanian.
- 2007 – 2011 **B.Sc. in Electrical Engineering (Electronics)**, Islamic Azad University of Yazd, Yazd, Iran.

Research Publications

Journal Articles

- 1 S. Makkinayeri, R. Guidotti, A. Basti, M. Woolrich, C. Gohil, M. Ermolova, R. Ilmoniemi, U. Ziemann, G. L. Romani, V. Pizzella, and L. Marzetti, "Investigating brain network dynamics in state-dependent stimulation: A concurrent electroencephalography and transcranial magnetic stimulation study using hidden markov models," *Brain Stimulation*, 2025.
- 2 G. Pieramico, S. Makkinayeri, R. Guidotti, A. Basti, D. Voso, G. L. Lucarelli Delia Romani, V. Pizzella, and L. Marzetti, "Robustness of brain state identification in synthetic phase-coupled neurodynamics using hidden markov models," *Frontiers in Systems Neuroscience*, 2025.
- 3 R. Guidotti, A. Basti, G. Pieramico, A. D'Andrea, S. Makkinayeri, M. Pettorruso, T. Roine, U. Ziemann, R. J. Ilmoniemi, G.-L. Romani, and V. Pizzella, "When neuromodulation met control theory," *Journal of Neural Engineering*, 2024.
- 4 L. Marzetti, A. Basti, R. Guidotti, A. Baldassarre, J. Metsomaa, C. Zrenner, A. D'Andrea, S. Makkinayeri, G. Pieramico, R. J. Ilmoniemi, *et al.*, "Exploring motor network connectivity in state-dependent transcranial magnetic stimulation: A proof-of-concept study," *Biomedicines*, vol. 12, no. 5, p. 955, 2024.
- 5 L. Marzetti, S. Makkinayeri, G. Pieramico, R. Guidotti, A. D'Andrea, T. Roine, T. P. Mutanen, V. H. Souza, D. Kicic, A. Baldassarre, *et al.*, "Towards real-time identification of large-scale brain states for improved brain state-dependent stimulation," *Clinical Neurophysiology*, vol. 158, pp. 196–203, 2024.

Conference Proceedings

- 1 A. Geramipour, S. Makki, and A. Erfanian, "Neural network based forward prediction of bladder pressure using pudendal nerve electrical activity," in *2015 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, IEEE, 2015, pp. 4745–4748.

Skills

- Languages  Persian, English
- Coding  Matlab, Python, C/C++, R, SPSS, LabVIEW, ...

Academic Presentations and Visits

- 2024  **DGKN, Frankfurt, Germany**, Oral Presentation.
- 2021-2024  **Connect-to-Brain Periodic Meetings**, Oral Presentations.
- 2022  **Science Factory, Porvoo, Finland**, Workshop Participation.
-  **8th Science Factory, Porvoo, Finland**, Poster Presentation.
- Nov, 2021  **University of Tübingen, Tübingen, Germany**, Visiting Researcher.

References

- Prof. Laura Marzetti**  Department of Neuroscience, Imaging and Clinical Sciences, University 'G. D'Annunzio' of Chieti-Pescara (UdA), Italy,
Email: laura.marzetti@unich.it
- Prof. Vittorio Pizzella**  Department of Neuroscience, Imaging and Clinical Sciences, University 'G. D'Annunzio' of Chieti-Pescara (UdA), Italy,
Email: vittorio.pizzella@unich.it

References (continued)

Dr. Roberto Guidotti  Department of Neuroscience, Imaging and Clinical Sciences, University 'G. D'Annunzio' of Chieti-Pescara (UdA), Italy,
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