

Alessandro Tonin

Castello 5820, 30122 Venezia
+39 041 22 07 406
+39 329 333 69 53
alessandro.tonin@hsancamillo.it
tonin.ale@gmail.com

19th January 1990
Venice, Italy



Experience

- 2023–now **Research Engineer**, IRCCS Ospedale San Camillo, Venezia, Italy
Staff Scientist
Signal analysis, experiment design for neurorehabilitation research projects, and contributing to open science
- 2023–now **Web developer**
Backend development and support for websites
- 2023–2023 **Automation and model engineer**, SATE, Venezia, Italy
Developing models for systems diagnostic in the fields of automation and space.
Backend development of distributed software for multi-purpose signal analysis.
- 2020–2022 **Research Associate**, Wyss Center for Bio and Neuroengineering, Genève, Switzerland
Working in a single-case study to enable communication in a ALS patient in completely locked-in state. Developed and maintained software that allows communication by using intracortical signals.
Data analysis of intracortical signals.
Frequent contact with patients and relatives.

Education

- 2017–2023 **Ph.D. (Dr. rer. nat.) in Computer Science**, Institut für Medizinische Psychologie und Verhaltensneurobiologie, Universität Tübingen, Tübingen, Germany
Supervisors: Niels Birbaumer, Gerard Pons-Moll, Natsue Yoshimura
Title: Binary Communication Techniques in Locked-in and Completely Locked-in Patients
DOI: <https://doi.org/10.15496/publikation-87891>
Research topics: Brain-Computer Interface, Electroencephalogram, Intracortical recordings, Amyotrophic Lateral Sclerosis, Signal processing, Natural language
- 2013–2016 **Master in Automation Engineering**, Università degli Studi di Padova, Padova, Italy.
Systems theory, Control techniques, Estimation, Identification
- 2009–2013 **Bachelor in Information Engineering**, Università degli Studi di Padova, Padova, Italy.
Mathematics, Informatics, Electronic, System theory, Telecommunications

Grant, Awards, and Fundings

- 2025–now **ERMES1** (Malvestio S.p.A. - Private financing)
Title: Pilot study on the use of next-generation hospital beds (smart beds) to improve the organizational effectiveness of a ward.

Topic: Mixed-methods study assessing the organizational impact of smart beds on nursing workload and patient safety, including staff interviews, response time metrics, and correlation of piezoelectric sensor data with standard medical devices.

Amount: € 96.000 **Role:** PI

Open Source Projects

- 2025-now **Herbert:** Maintainer for an open-source toolbox for building modular pipelines for connectivity and network analysis of resting-state M/EEG data.
<https://github.com/SanCamilloIRCCS-OndaLab/Herbert>
- 2025-now **Gondola:** Contributor for a MATLAB toolbox to facilitate Brain network analysis (and exploration).
<https://github.com/giorgioarcara/Gondola>
- 2019-now **DeQua:** Full-stack developer for an open-source navigation platform in Venice. Backend developed in Python; frontend written in Typescript using Angular2
<https://www.dequa.it>

Publications (last updated on 27.01.2026)

Published

- 2025 **Tonin A**, Semprini M, Kiper P, Mantini D. Brain-computer interfaces for stroke motor rehabilitation. *Bioengineering*; 2025. <https://doi.org/10.3390/bioengineering12080820>
- 2023 **Tonin A**. “Binary Communication Techniques in Locked-in and Completely Locked-in Patients.” *Dissertation, Universität Tübingen*; 2023. <https://doi.org/10.15496/publikation-87891>
- 2022 Chaudhary U*, Vlachos I*, Zimmermann J B*, Espinosa A, **Tonin A**, Jaramillo-Gonzalez A, Khalili Ardali M, Topka H, Lehmborg J, Friehs G M, Woodtli A, Donoghue J P, Birbaumer N. “Spelling interface using intracortical signals in a completely locked-in patient enabled via auditory neurofeedback training”. *Nature Communications*; 2022. <https://doi.org/10.1038/s41467-022-28859-8>
- 2021 Maruyama Y*, Yoshimura N*, Rana A, Malekshahi A, **Tonin A**, Jaramillo-Gonzalez A, Birbaumer N, Chaudhary U. “Electroencephalography of completely locked-in state patients with amyotrophic lateral sclerosis”. *Neuroscience Research*; 2021. <https://doi.org/10.1016/j.neures.2020.01.013>
- 2021 Khalili-Ardali M, Wu S, **Tonin A**, Birbaumer N, Chaudhary U. “Neurophysiological aspects of the completely locked-in syndrome in patients with advanced amyotrophic lateral sclerosis”. *Clinical Neurophysiology*; 2021. <https://doi.org/10.1016/j.clinph.2021.01.013>
- 2021 Secco A, **Tonin A**, Rana A, Jaramillo-Gonzalez A, Khalili Ardali M., Birbaumer N., Chaudhary U. “EEG power spectral density in locked-in and completely locked-in state patients: a longitudinal study”. *Cognitive Neurodynamics*; 2021. <https://doi.org/10.1007/s11571-020-09639-w>
- 2021 Jaramillo-Gonzalez A, Wu S, **Tonin A**, Rana A, Khalili Ardali M, Birbaumer N, Chaudhary U. “A dataset of EEG and EOG from an auditory EOG-based communication system for patients in locked-in state”. *Scientific Data*; 2021. <https://doi.org/10.1038/s41597-020-00789-4>
- 2021 Yoshimura N, Umetsu K, **Tonin A**, Maruyama Y, Harada K, Rana A, Ganesh G, Chaudhary U, Koike Y, Birbaumer N. “Binary Semantic Classification Using Cortical Activation with Pavlovian-Conditioned Vestibular Responses in Healthy and Locked-In Individuals”. *Cerebral Cortex Communications*; 2021. <https://doi.org/10.1093/texcom/tgab046>
- 2020 **Tonin A***, Jaramillo-Gonzalez A*, Rana A, Khalili Ardali M, Birbaumer N, Chaudhary U. “Auditory Electrooculogram-based Communication System for ALS Patients in Transition from Locked-in to Complete Locked-in State”. *Scientific Report*; 2020. <https://doi.org/10.1038/s41598-020-65333-1>
- 2020 Martínez-Cerveró J, Khalili Ardali M, Jaramillo-Gonzalez A, Wu S, **Tonin A**, Birbaumer N, Chaudhary U. “Open Software/Hardware Platform for Human-Computer Interface Based on

Electrooculography (EOG) Signal Classification". *Sensors*; 2020.

<https://doi.org/10.3390/s20092443>

- 2019 Malekshahi A, Chaudhary U, Jaramillo-Gonzalez A, Lucas Luna A, Rana A, **Tonin A**, Birbaumer N, Geis S. "Sleep in the Completely Locked-in State (CLIS) in Amyotrophic Lateral Sclerosis". *Sleep*; 2019. <https://doi.org/10.1093/sleep/zsz185>
- 2018 **Tonin A**, Birbaumer N, Chaudhary U. "A 20-questions-based binary spelling interface for communication systems". *Brain Science*; 2018. <https://doi.org/10.3390/brainsci8070126>

Conference and Proceedings

- 2022 **Tonin A**, Ibañez-Soria D, Ramos da Cruz J, Lee K, Espinosa A, Ramsey N F, Zimmermann J B. "Evolution of BCI performance over three years of recordings with intracortical microelectrode arrays in a complete locked-in syndrome patient". At *Society for Neuroscience*; 2022
- 2021 **Tonin A**, Ibañez-Soria D, Ramos da Cruz J, Lee K, Espinosa A, Ramsey N F, Zimmermann J B. "Independent Home Use of a Microarray Brain Computer-Interface in a Completely Locked In-Patient". At *Society for Neuroscience*; 2021
- 2019 **Tonin A**, Khalili Ardali M, Jaramillo-Gonzalez A, Rana A, Birbaumer N, Chaudhary U. "Brain Computer Interface based Communication for Individuals in Locked-in State without Gaze Fixation". At *Society for Neuroscience*; 2019
- 2018 **Tonin A**, Malekshahi A, Rana A, Lucas Luna A, Birbaumer N, Chaudhary U. "Auditory Speller System for Communication with Patients in Completely Locked-in State". At *European Congress of NeuroRehabilitation*; 2018
- 2017 Oboe R, **Tonin A**, Yu K, Ohnishi K, Turolla A. "Weight estimation system using surface EMG armband". In: *Proceedings of the IEEE International Conference on Industrial Technology*; 2017
- 2016 Oboe R, **Tonin A**, Yu K, Ohnishi K, Turolla A. "Robotic finger rehabilitation system for stroke patient using surface EMG armband". In: *IECON Proceedings (Industrial Electronics Conference)*; 2016

* equal contribution

Venezia, 14.05.2026