LEONARDO TOZZI, MD, PHD

San Francisco Bay Area

INTRODUCTION

Neuroscientist developing novel biomarkers of brain illness. Leads studies end-to-end from acquiring to analyzing and deriving clinically actionable insights. Includes combining large multi-modal recordings of human brain physiology, biosensors, genetics, biological markers, behavioral measurements, and clinical assessments.

EDUCATION

PhD, Trinity College Dublin, Dublin, Republic of Ireland *2017*
MD, Pisa University and Sant'Anna School of Advanced Studies, Pisa, Italy *2014*

EXPERIENCE

Ceribell Nov 2023 - Present
Director of Research & Data *Sunnyvale, United States*

- Initiated, built up and managed external partnerships to advance research in Ceribell's areas of interest.
- Led development of new AI neurodiagnostics to improve patient care.
- Collaborated with a multidisciplinary team of experts, including physicians, to design and conduct clinical studies for the development of EEG analysis algorithms.
- Built scalable data pipelines to analyze clinical study data and brain signal recordings.
- Ensured seamless integration of research initiatives with Ceribell's Clinical and Product teams, aligning with customer needs and the company's product roadmap.

Stanford Center for Precision Mental Health and Wellness 2022 - 2023
Director of Computational Neuroscience & Neuroimaging Program *Stanford, United States*

- Responsible for managing data collection and analysis across several large-scale brain imaging research projects.
- Advised Center Investigators about experimental designs and protocols best suited for their research question.
- Managed and mentored research assistants on study design, data collection, data analysis and scientific writing.
- Created and maintained a database containing >5,000 brain scans, cognitive tests and clinical questionnaires.
- Coded and maintained reproducible, consistent and efficient pipelines in Matlab, R and Python to analyze large multi-modal data sets of brain, behavior and questionnaire data.
- Managed access to the Center database and provided data to Center members and collaborators.

Stanford University 2022
Instructor, Stanford Continuing Studies *Stanford, United States*

- Curriculum creator and live lecturer for "The Impact of Mental Illness on the Human Brain".
- Topics included methods to quantify brain structure and function in humans, how the brain is impacted by the most common mental illnesses and evaluating the explanations of mental illnesses in press publications.

Stanford University (Williams PanLab) 2018 - 2021
Postdoctoral Neuroimaging Researcher *Stanford, United States*

- Responsible for the "Human Connectome Project for Disordered Emotional States", leveraging brain function to develop novel biomarkers for treatment and diagnosis of mood disorders.
- Set up protocols to gather brain scans, behavioral and self-report data from over 300 participants.
- Built predictive models of treatment response based on brain biomarkers of cognitive function.
- Delivered high-impact peer-reviewed publications by successfully collaborating with colleagues from multiple disciplines (engineers, data scientists, research coordinators, faculty).

· Contributed to the Stanford community as a council member of the Stanford University Postdoc Association.

Trinity College Dublin 2014 - 2017
Research Fellow *Dublin, Republic of Ireland*

· Collected and analyzed brain data from >100 individuals to identify biomarkers relevant to depression.
· Collaborated closely with geneticists and molecular biologists to integrate diverse data such as hormone levels, inflammatory markers, genetics as well as adverse life experiences with brain physiology measures.
· Analyzed large (∼4000 participants) imaging data sets from multiple sites for meta- and mega-analyses.

TECHNICAL SUMMARY

Academic publications: 48 peer-reviewed articles, 1 book chapter, 8 preprints, 3 conference talks.
Grants and funding: ACE-D NIH U01 (2024), HARMONY NIH R01 (2024), CONNECT Stanford grant (2019), Meta-science Fetzer Franklin fund grant (2019), Erasmus Placement EU funding (2014), Full scholarship for medical school (2008-2013).
Programming languages: Python for data manipulation and visualization (Pandas, SciPy, NumPy, Matplotlib), statistical analyses (statsmodels), machine learning (Scikit-learn, PyTorch), analysis of brain signals (MNE, Nilearn); R for statistical analyses; Matlab for analysis of large multi-dimensional datasets and time series; Unix shell for neuroimaging software and scripting.
Languages: Fluent in English, Italian, German and French, beginner in Mandarin Chinese.

SELECTED PEER-REVIEWED PUBLICATIONS (10 OF 48)

"Personalized brain circuit scores identify clinically distinct biotypes in depression and anxiety" *Tozzi et al. Nature Medicine, 2023*

"A cognitive neural circuit biotype of depression showing functional and behavioral improvement after transcranial magnetic stimulation in the B-SMART-fMRI trial" *Tozzi et al. Nature Mental Health, 2023*

"Relating whole-brain functional connectivity to self-reported negative emotion in a large sample of young adults using group regularized canonical correlation analysis" *Tozzi et al. Neuroimage, 2021*

"Reduced functional connectivity of default mode network subsystems in depression: Meta-analytic evidence and relationship with trait rumination" *Tozzi et al. NeuroImage Clinical, 2021*

"The human connectome project for disordered emotional states: Protocol and rationale for a research domain criteria study of brain connectivity in young adult anxiety and depression" *Tozzi et al. Neuroimage, 2020*

"Test-retest reliability of the human functional connectome over consecutive days: identifying highly reliable portions and assessing the impact of methodological choices" *Tozzi et al. Network Neuroscience, 2020*

"Connectivity of the cognitive control network during response inhibition as a predictive and response biomarker in major depression: evidence from a randomized clinical trial" *Tozzi et al. Biological Psychiatry, 2019*

"Interactive impact of childhood maltreatment, depression, and age on cortical brain structure: Mega-analytic findings from a large multi-site cohort" *Tozzi et al. Psychological Medicine, 2019*

"Epigenetic changes of FKBP5 as a link connecting genetic and environmental risk factors with structural and functional brain changes in major depression" *Tozzi et al. Neuropsychopharmacology, 2017*

"Functional magnetic resonance imaging correlates of emotion recognition and voluntary attentional regulation in depression: a generalized psycho-physiological interaction study" *Tozzi et al. Journal of Affective Disorders, 2016*