

# Omid Sani

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Resume (full CV available on [omidsani.com](https://omidsani.com))

(Last updated on: 02/15/2024)

Tip: some items are clickable links

## Research Experience

- 2015–present **Prof. Shanechi's group (NSEIP Lab)**, USC, Los Angeles, California, USA ([nseip.usc.edu](https://nseip.usc.edu)).  
- **2022–present: Research Associate**  
- 2020–2022: Postdoctoral Scholar  
- 2015–2020: **PhD** → **Thesis**: Modeling and control of behaviorally relevant brain states  
- 2017–2019: **MSc, Computer Science**
- 2012–2015 **Prof. Shamsollahi's group (BiSIPL Lab)**, Sharif University of Technology, Tehran, Iran.  
- 2013–2015: **MSc** → **Thesis**: Detection of Movement Related Cortical Potentials in EEG  
- 2009–2013: **BSc** → **Thesis**: Event Related Potentials in Brain Computer Interfaces
- 2014 **Fully funded internship in Prof. Millán's group (cnbi.epfl.ch)**, EPFL, Switzerland.

## Research Interests

Brain-Machine Interfaces, Neuroscience, Machine Learning, Signal Processing, Control Theory

## Selected Honors and Awards

- 2021 Received the 2021 Ballhaus prize for Excellence in Graduate Engineering Research, awarded to one PhD dissertation across USC Viterbi School of Engineering (news story)
- 2019 Received the MHI Scholar award in the USC ECE department
- 2019 A winner of the 2019 international BCI Award for our work on closed-loop BCIs for treatment of neuropsychiatric disorders ([bci-award.com/2019](https://bci-award.com/2019))
- 2015 Received the Annenberg Fellowship with admission to USC ECE PhD program

## Selected Publications ([Google Scholar: scholar.google.com/citations?user=HMRETVYAAAAJ](https://scholar.google.com/citations?user=HMRETVYAAAAJ))

### Patents

- 2023 M. M. Shanechi, **O. G. Sani**, “*Preferential system identification (PSID) for joint dynamic modeling of signals with dissociation and prioritization of their shared dynamics, with applicability to modeling brain and behavior data*”, US Patent 11,832,953

### Journal Papers Under Review

- 2021 **O. G. Sani**, B. Pesaran, M. M. Shanechi, “*Where is all the nonlinearity: flexible nonlinear modeling of behaviorally relevant neural dynamics using recurrent neural networks*” bioRxiv 2021.09.03.458628, <https://doi.org/10.1101/2021.09.03.458628>

### Journal Papers

- 2023 P. Vahidi\*, **O. G. Sani\***, M. M. Shanechi, “*Modeling and dissociation of intrinsic and input-driven neural population dynamics underlying behavior*”, **Proceedings of the National Academy of Sciences (PNAS)** (2024), <https://doi.org/10.1073/pnas.2212887121> (\*: equal contribution)
- 2021 **O. G. Sani**, H. Abbaspourazad, Y. T. Wong, B. Pesaran, M. M. Shanechi, “*Modeling behaviorally relevant neural dynamics enabled by preferential subspace identification*”, **Nature Neuroscience** (2021), <https://doi.org/10.1038/s41593-020-00733-0>

- 2021 Y. Yang\*, S. Qiao\*, **O. G. Sani**, J. I. Sedillo, B. Ferrentino, B. Pesaran, M. M. Shanechi, 2021. “Modelling and prediction of the dynamic responses of large-scale brain networks during direct electrical stimulation”, **Nature Biomedical Engineering** (2021), <https://doi.org/10.1038/s41551-020-00666-w> (\*: equal contribution)



*Media coverage highlights:*

→ News and Views article by J. I. Chapeton and K. A. Zaghoul *Modelling multiregional brain activity*, Nature Biomedical Engineering 5, 293–294 (2021)

→ Selected as the journal cover article in Nature Biomedical Engineering

- 2018 **O. G. Sani\***, Y. Yang\*, M. B. Lee, H. E. Dawes, E. F. Chang†, M. M. Shanechi†, “Mood variations decoded from multi-site intracranial human brain activity”, **Nature Biotechnology** (2018), <https://doi.org/10.1038/nbt.4200> (\*: equal contribution, †: senior authors)



*Media coverage highlights:*

→ The Wall street Journal: Brain Data Could Read Moods, Potentially Treat Depression

→ ScienceNews: Brain-zapping implants that fight depression are inching closer to reality

→ IEEE Spectrum: The Mood Ring of Algorithms Could Zap Your Brain to Help You Feel Better

→ New Atlas: Tracking brain waves to decode mood could help fight depression

→ News and Views article by A. Etkin *Decoding mood*, Nature Biotechnology 36, 932–933 (2018)

→ Selected as the journal cover article in Nature Biotechnology

## Coding Experience

Python (Tensorflow), Matlab, Web dev (TypeScript, JavaScript, HTML, CSS), C++, Pascal, PHP

## Selected Side Projects

- 2023 **When Lotto** (whenlotto.com,@whenlotto): A website tracking the expected prize of lotteries. *Tech:* Python, Django, Javascript, runs on an AWS VPS.
- 2019 **IPDB** (ipdb.page): A database of academic publications with community Q&A and rating features. *Tech:* Python, Django, Javascript, runs on an AWS VPS.
- 2019 **SelfA** (pleaselet.me/SelfA): Web-based tool for administering self-report psychometric questionnaires and providing experimental task instructions. *Tech:* Firestore database, Angular, runs on Google cloud.
- 2018 **TweetAs** (pleaselet.me/tweetas): Builds an n-gram language model from prior tweets of a twitter account and generates new tweets. *Tech:* Python, MongoDB, Angular, hosted on Google cloud.
- 2018 **WeSay** (pleaselet.me/wesay): A social collaboration project where people vote on how to complete a sentence. *Tech:* Google cloud functions, Firestore database, Angular, runs on Google cloud.
- 2017 **Parrot Bot** (telegram.me/parrrotbot): A Telegram bot that builds an n-gram language model from each person and imitates them. *Tech:* Python, MongoDB, hosted on Google cloud.
- 2017 **PackMan** (github.com/OmidS/PackMan): Package management for MATLAB.
- 2016 **Poem Bot** (telegram.me/sherbot): Telegram bot for Persian poems. *Tech:* Node.js, SQLite, on AWS.
- 2015 **20Q**: An online social 20 questions game. *Tech:* Node.js, loopback, Angular.
- 2013 **QuickSSVEP** (omids.github.io/quickssvep): A web based SSVEP stimulator.
- 2013 **Onlinify** (github.com/OmidS/onlinify): A MATLAB toolbox for online processing of EEG data recorded with BCI2000, transferred with Fieldtrip Buffer.
- 2012 **X86 based multiplayer game with ARM based connectivity node**, *GUI on clients and game logic on server; all connected through an ARM based hub board.*
- 2011 **Firefighter robot with wireless controller**, *8051 chip on robot and AVR on controller. Infrared based auto fire detection and approaching and water extinguishing.*