Dr Andrew X. Stewart, PhD

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I am a passionate computational neuroscientist living in Northern California. Most recently, I have been working on consumer sleep-tracking EEG earbuds. US Permanent Resident with no sponsorship required.

Employment

Senior Research Scientist, NextSense (Google X spinoff) Nov 2022 – Present
As the lead neuroscientist, I helped turn a prototype into a consumer EEG sleep tracking device selling tens of thousands of units. Defined metrics of EEG signal quality and managed iterative improvements in software, hardware, and human-compatibility.

Neurotech Research Consultant, Remote June 2021 – Present
Advised Logitech, Intheon, and other Bay Area companies on EEG brain data classification.

NSF Neuroengineering Program Coordinator, UC Davis Aug 2022 – Sept 2023
The Neuroengineering center at UC Davis secured a large NSF NRT grant. As the first Program Coordinator for this 'NeuralStorm' program, I worked with professors, researchers and grad students to encourage and support frontier neuroengineering research. I created and managed many events and activities, including running the Neuroengineering Research Symposia and in-depth dissection of SOTA research in 'Neuroengineering Seminar Plus' events.

Postdoc Researcher and Lead Software Dev, UC Davis Jan 2016 – June 2021
I joined the UC Davis 'Center for Mind and Brain' in lab of world EEG expert Prof Steve Luck. With an NIH grant to improve EEG research software, we implemented 'ERPLAB' (see GitHub link, top contributor), which is now among the top most used EEG research software packages, with tens of thousands of research papers.

Postdoctoral Research Associate, University of Edinburgh Nov 2013 – Dec 2015
As I was completing my PhD, I was actively working with researchers in adjacent areas. At the University of Edinburgh Brain Research Imaging Centre (BRIC), I worked with Dr Cyril Pernet to better implement robust stats for neuroimaging experiments. See our LIMO EEG website, publications, and GitHub.

Grad Student TA, University of Edinburgh Sept 2010 – Dec 2013
Taught programming, applied machine learning, and probabilistic modelling and reasoning instruction. Assisted professors with course content delivery.

Research Lab Assistant, Ness Foundation June 2006 – Sept 2006
Summer job in a 'wet' neuroscience genetic research lab. I worked on neurodegenerative processes, schizophrenia genotyping, and potential relations to metabolic indicators. See our paper on finding TGM2 mutations in families with high schizophrenia prevalence.

Education

PhD in Neuroinformatics - University of Edinburgh, 2015. **Assessing EEG neuroimaging with machine learning.** We examined advanced analysis of EEG data using a combination of machine learning tools, particularly Independent Component Analysis (ICA) and Support Vector Machines, to find separable sources of variation in the data, and assess how well data from different sources (spatially, temporally, and in the power dynamics) could predict aspects of visual classification tasks for the subject. This revealed surprisingly high accuracy classification of visual state when using a specific set of ICA sources.

MSc in Neuroinformatics - University of Edinburgh, 2009. GPU-based acceleration of an EEG brain-computer interface. Here, I used the parallel power of computer graphics cards to tailor and reimplement a machine learning algorithm. This increased the EEG processing speed 100-fold, thus greatly improving a brain-computer interface.

MSc in Neuroscience - University of Edinburgh, 2008. Calcium-imaging as a metric of real-time neural activity on novel patterns in wet neural network. Here, rat neurons were grown on an etched selectively-adhesive surface in order to induce various topologies of neuronal connections. Neural activity was then measured with calcium-imaging microscopy.

BSc Hons in Biomedical Sciences - University of Edinburgh, 2007.

Skills

Neuroscience - computational neuroscience, EEG, MEG, fMRI, neuronal culture

Industry - consumer EEG, neural signals hardware validation, modern software dev collaboration and coordination

Scientific computing - Python, Matlab, TensorFlow, GPU clusters, robust stats, probabilistic models, stats interpretation

Publications

Find a recent record of papers and citations on Google Scholar or ORCID:
scholar.google.com/citations?user=vuFq-BCD1ogC
https://orcid.org/0000-0002-9402-4411

Journal Articles

Bradford, M., Law, M. H., **Stewart**, A., Shaw, D. J., Megson, I. L., & Wei, J. (2009). The TGM2 gene is associated with schizophrenia in a British population. American Journal of Medical Genetics https://doi.org/10.1002/ajmg.b.30813

Stewart, A. X., Nuthmann, A., & Sanguinetti, G. (2014). Single-trial classification of EEG in a visual object task using ICA and machine learning. Journal of Neuroscience Methods. https://doi.org/10.1016/j.jneumeth.2014.02.014

Stewart, A., Rousselet, G., & Pernet, C. (2014). The LIMO EEG toolbox : extending the statistical analysis of EEG data to the spectral domain. 20th Annual Meeting of the Organization for Human Brain Mapping (OHBM)

Kappenman, E. S., Farrens, J. L., Zhang, W., **Stewart**, A. X., & Luck, S. J. (2020). ERP CORE: An Open Resource for Human Event-Related Potential Research. Neuroimage. https://doi.org/10.1016/j.neuroimage.2020.117465

Luck, S. J., **Stewart**, A. X., Simmons, A. M., & Rhemtulla, M. (2020). Standardized Measurement Error: A Universal Measure of Data Quality for Averaged Event-Related Potentials. Psychophysiology, https://doi.org/10.31234/osf.io/dwm64

Ehrens, Jacobs, Thawornbut, **Stewart**, Paul, & Berent (2024) A Novel Earable Platform for Vagal Activation Monitoring during Transcutaneous Auricular Vagal Nerve Stimulation using Heart Rate Variability Analysis. ACM UbiComp 2024 https://doi.org/10.1145/3675094.3680522

Xianglong Wang, Vincent Tran, Gabriela Lee, Sadie Jean Davis, Mary Spooner, Mariko Chang, **Andrew X Stewart**, Christopher John Nitta, Tiffany Marie Chan, Angelika Aldea Tamura, Xin Liu, Gene Gurkoff, Wilsaan M Joiner, Erkin Seker, Karen A Moxon (2025) NeuralStorm: Training Graduate Students in Neuroengineering. ASEE 2025 https://peer.asee.org/neuralstorm-training-graduate-students-to-take-neuro

Jonathan Berent, Prabhjyot Saini, **Andrew X Stewart**, Devansh Bheda, Konstantin Borodin, Akshay Paul, Brian Tracey, Caroline Dong, Dmitri Volfson, Derek L Buhl, David B Rye
(2026) Bioelectronic Medicine
A novel, wearable, in-ear EEG technology to assess sleep and daytime sleepiness
https://link.springer.com/article/10.1186/s42234-026-00207-x

Yashar Kiarashi, Jonathan Berent, Mohsen Motie-Shirazi, Qiao Li, **Andrew X Stewart**, Prabhjyot Saini, Daniela Grimaldi, Kathryn J Reid, Phyllis C Zee, Ken A Paller, Allan I Levey, Gari D Clifford Bedtime Brain State Predicts the Impact of Closed-Loop Auditory Stimulation on Sleep and Cognition https://www.medrxiv.org

Project contributions

ERPLAB EEG analysis tool - software to process, analyze and display event-related activity from EEG, developed with Prof Steve Luck at UC Davis `https://github.com/lucklab/erplab`

Director with the Convergence Analysis research group on promoting safe use of AI.
`http://convergenceanalysis.org/`

Neuroglycerin - group predicting seizure occurrence using machine learning of EEG data. Silver award for high machine learning accuracy of seizure prediction on Kaggle. `https://www.kaggle.com/c/seizure-prediction`

LIMO EEG statistics package - now included with EEGLAB: As part of my postdoc with BRIC, Cyril Pernet, Guillaume Rousselet, and Arno Delorme, I wrote a new version of the LIMO EEG stats tools to examine EEG data in ERSP space, ITC, high-dimensional analysis, and greatly improved the speed of these tools.
`https://github.com/LIMO-EEG-Toolbox/limo_eeg/graphs/contributors`

Conference contributions

Presented work on wearable EEG sensors at the 12th IEEE Neural Interfacing conference in San Diego, Nov 2025

Joined Neural Information Processing Systems (NIPS / NeurIPS) conference, and AI-neuroscience co-workshop in Montreal, 2019

Senior Fellow of the 2018 Kavli Summer Institute for Cognitive Neuroscience, contributing to the new Cognitive Neuroscience textbook with Michael Gazzaniga, Richard Ivry, and Ron Mangun.

Fellow of the 2017 Kavli Summer Institute for Cognitive Neuroscience.

Speaker at the Effective Altruism Global 2016 conference in Berkeley. Along with Justin Shovelain, we presented possible models of AI scenarios from Convergence Analysis.

Mentor with the CFAR Rationality training program, Berkeley, 2016-2017. rationality.org

Presenter at the Asilomar 2016 Brain-Computer Interface conference.

Speaker at the 2016 Northern California Consciousness (NCC) conference.

Instructor at the EEGLAB workshop at Aspet, France 2013

Speaker at Neural Engineering Young Researchers, Royal Academy of Engineering, Warwick 2012

EEGLAB workshop at Swartz Center for Computational Neuroscience, UCSD 2010

Presented a poster at Society for Neuroscience, San Diego 2010

Talk at International Workshop on Advances in Electrocorticography, Wadsworth Center, New York 2009

Presented a poster at FENS Forum of Neuroscience, Geneva 2008

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