

# Andrew Bender

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## SUMMARY

Computational, cognitive neuroscientist with 7 years of experience in time series analysis, machine learning, and digital signal processing. Experienced in designing, developing, and deploying algorithms for large-scale data analysis. Passionate about leveraging data analytics and machine learning to solve real-world problems.

## EXPERIENCE

### Graduate Student Researcher | Neural & Data Analytics Lab, UC San Diego

August 2019 - Present, La Jolla, CA

- Designed signal processing pipeline to isolate neural rhythms from resting-state electroencephalography (EEG) data and identify biomarkers for autism and ADHD in dataset of nearly 3000 children.
- Developed novel, high-throughput spectral analysis technique to decode spatial location of stimuli from neural alpha rhythms across seven different visual working memory tasks and 112 adults.
- Applied cutting-edge, sliding window spectral parameterization to disentangle the role of neural alpha rhythms from neural aperiodic activity in working memory.

### Graduate Student Researcher | Perception and Cognition Lab, UC San Diego

January 2020 - May 2020, La Jolla, CA

- Devised psychophysical experiment to allow participants to use decoding feedback to improve visual working memory performance in real-time during functional magnetic resonance imaging (fMRI).
- Trained inverted encoding models to decode spatial location from latent memory representations across 12 different brain regions in early visual cortex.
- Transformed lab-wide analysis pipeline from MATLAB into Python, improving generality and customizability while reducing code length 255%.

### Undergraduate Researcher | Multisensory Research Lab, Vanderbilt University

August 2016 - May 2019, Nashville, TN

- Designed and implemented binocular rivalry paradigm to improve attentional deficits following acute stroke.
- Constructed GPU implementation of custom, deep 14-layer residual neural network in TensorFlow that decreased training time over 5000%.
- Published and defended Honors Thesis comprising four different machine learning models that diagnosed autism with 60% accuracy from ensemble of minimally processed, multi-modal brain recordings.

## EDUCATION

### Doctor of Philosophy in Neurosciences | UC San Diego

3.911, La Jolla, CA, 2025

- Computational Neuroscience Specialization

### Master of Science in Neurosciences | UC San Diego

3.911, La Jolla, CA, 2022

### Bachelor of Arts in Neuroscience | Vanderbilt University

Minor in Scientific Computing, 3.914, Nashville, TN, 2019

- Awarded Highest Honors in Neuroscience, magna cum laude

## SKILLS

Technical skills: digital signal processing, time series analysis, data wrangling, computational modeling, statistics, data visualization, machine learning, parallel computing, shell scripting, cluster computing, GPU programming, reinforcement learning, web development

Data tools and languages: Python, NumPy, SciPy, pandas, seaborn, MNE, TensorFlow, scikit-learn, PyTorch, Keras, MATLAB, HTML, CSS, Ruby, C, C#, SQL