Jeffrey Chiou

jeffchiou@gmail.com
on request
jeffchiou.com
github.com/jeffchiou

Employment

Artificial Intelligence Fellow

Oct. 2020 - Present
Pi School, Rome, Italy

- Created effective machine learning models for medical diagnosis.
- Upheld stakeholder interests and clearly communicated technical details while working remotely in a team.
- Won competitive grant to participate in this AI program.

Machine Learning Engineer

Feb. 2020 - Apr. 2020
Holy Grail, Inc. San Francisco, CA

- While working remotely, implemented cutting edge machine learning techniques in a proprietary AI stack.
- Managed and added features to both the front-end and the back-end of the customer-facing web app.
- Updated product API and managed cloud computing services (AWS).
- Led a custom machine learning edge device project and shipped it to customers.

National Science Foundation (NSF) Graduate Fellow

Apr. 2013 - Sep. 2016
University of Pittsburgh, Carnegie Mellon University

Collaborated with Pitt and CMU labs on brain-computer interfaces (BCIs).

- Used various engineering and machine learning techniques, such as dimensionality reduction, Kalman filtering, and clustering, to process and analyze neural data from electrode array-based BCI experiments.
- Spearheaded lab code refactoring effort emphasizing reuse, consistent style, documentation, and organization.
- Automated setup of experiments and repetitive lab tasks using Autohotkey, PowerShell, and IFTTT.
- Effectively communicated complex ideas through data visualization, presenting at journal clubs, teaching review sessions as a TA, and volunteering for a high school science outreach program.

Projects

CoordiScroll

Open source advanced synchronized scrolling in JavaScript using a publish-subscribe architecture. Demo utilizes D3.js.
jeffchiou.github.io/coordiscroll/

JeffChiou.com

Open source personal website utilizing CoordiScroll. I blog about AI, tech, neuroscience, and philosophy. Created with Eleventy, styled with TailwindCSS. Previous version used Gatsby/React. www.jeffchiou.com

Genetic Algorithms on Spiking Recurrent Neural Networks

Used genetic algorithms to induce oscillatory behavior in a population of Izhikevich neurons.

Flexible and Fast Spike Raster Plotting

Open source highly rated MATLAB neural spike train graphing function with a demo simulation utilizing inhomogeneous Poisson processes.
mathworks.com/matlabcentral/fileexchange/45671-flexible-and-fast-spike-raster-plotting

Awards

NASA International Space Apps Challenge Global Nominee

2016

Created Dagu, an app prototype providing pastoral communities with networking capabilities and information about water availability, grassland, market prices, and safe routes.

NSF Graduate Research Fellowship

2013

Designed a brain-to-brain interface experiment in 2012 proposal, predating the first paper published by another group (Pais-Vieira, Lebedev, Kunicki, Wang, & Nicolelis 2013). Also proposed intra-brain artificial circuits.

C-SURE Fellowship

2010

Performed research on and wrote undergraduate thesis about the neuronal control of eye movements, at Pablo Blazquez's lab at Washington University in St. Louis.

Education

University of Pittsburgh

Aug. 2012 - Dec. 2016

M. S. Neurobiology, with thesis

Relevant Coursework

- Computational Neuroscience Methods (Pitt Math 3375) - Numerical methods, neuron models
- Neural Data Analysis (CMU 86-631) - Information theory, estimation, classification, signal detection theory, and continuous decoding
- Neural Signal Processing (CMU 18-698) - Derived and implemented algorithms and models from equations. Expectation-maximization, PCA, factor analysis, Kalman filters, log-exp-sum, Gaussian mixture models, stochastic processes, probabilistic graphical models... etc.

Washington University in St. Louis

Aug. 2008 - May 2012

B. A. Biology, Neuroscience Track
B. A. Philosophy-Neuroscience-Psychology, Cognitive Neuroscience Track

Skills

AI & Machine Learning

- PyTorch, Pyro, PyMC3, scikit-learn, pandas, numpy, scipy, SQL
- Techniques including Bayesian neural networks, Gaussian processes, boosting methods, transformers ...etc.
- AutoML, Bayesian optimization

Math

- Probabilistic graphical models, causal inference, and Bayesian modeling
- Dynamical systems and computational neuroscience
- Frequentist and Bayesian statistics
- Information theory

Development

- Python, R, Julia
- MATLAB / Octave
- HTML, CSS / Sass, JS / JSX
- React, TailwindCSS, GraphQL, Gatsby, Styled Components
- PostgreSQL, SQLite
- Flask, FastAPI, some Django
- Some Haskell, C#, and Racket
- Git

Miscellaneous

- Windows, Linux
- VS Code, Vim
- Docker
- AWS, Heroku + some GCP, Azure
- Algorithms, FP, OOP