Jason K. Chow

Comptuational Cognitive Scientist

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Data-driven computational researcher focused on building new tools to tackle complex research problems. Possess strong technical skills in machine learning and statistical analysis aimed at psychometrics, experimental psychology, and AI. Apt at learning new skills and applying techniques from different fields to yield insights that would be otherwise impossible. Thrives in fast-paced settings and excels working independently or collaboratively.

Experience

Contract **Research Engineer II @ Meta • 2024–** Tundra Technical Solutions

Primary maintainer for AEPsych, an open-source adaptive experimentation package for psychophysics experiments. Part of an interdisciplinary research team working on prototype hardware targeting novel haptic perceptions.

- *Implemented GPU support in AEPsych yielding up to 5x speed-ups during experiments.*
- *Benchmark prospective methods using domain-specific simulation to evaluate real-world efficacy.*
- *Translated research code into production-ready features fully integrated with a wider set of tools.*
- *Designed easy-to-use research pipelines leveraging the package for a variety of research applications.*
- *Expanded and optimized testing suite, CI, and automation across internal and external tools to improve development efficiency and lower maintenance needs.*
- *Designed, implemented, and monitored perception experiments for prototype hardware targeting novel haptic perception.*
- *Developed novel models of haptic perception for an end-to-end data collection and analysis pipeline.*
- *Coordinated wider interdisciplinary efforts towards understanding how mechanical factors yield reliable perception.*

Education

PhD. in Psychological Sciences • **2018—2024** Vanderbilt University

Research on high-level perception using deep neural networks, cognitive models, simulation techniques, and psychometrics.

- *Developed scalable framework to reliably measure representational variability across deep neural networks due to differences in model attributes (e.g., model architecture, training dataset, and training regime) across 700+ models and 9 datasets.*
- *Distilled insights from high-dimensional large-scale analysis (e.g., INDSCAL, hierarchical clustering) of deep neural network models to efficiently instantiate parametric model manipulations across a set of 100 new networks to systematically vary representations to model individual differences in object recognition ability.*

Languages

Python • R • Javascript • Bash • SQL • MatLab

Libraries & Technologies

NumPy • Pandas • Scikit-learn • SciPy • Tensorflow • PyTorch • Flask • Jupyter • D3.js • Observable Framework • jsPsych • Tidyverse • Lavaan • BayesFactor • Git • MySQL • GCP / AWS • GitHub Actions • Docker

Relevant Personal Projects

Raided Lost Ark
github.com/evilandrex/raided-loa

Website to analyze global trends in performance across classes in the game. Developed data scraping Python CLI for use with Github Actions. Displayed data in interactive dashboard built with D3.js and Observable Framework. Visited by 22K+ users.

Selected Publications

2024 **Chow, J. K.** & Palmeri, T. J. Manipulating and Measuring Variation in Deep Neural Network (DNN) Representations of Objects. Cognition https://osf.io/preprints/psyarxiv/yw49e

2024 **Chow, J. K.**, Palmeri, T. J. & Gauthier, I. Distinct but related abilities for visual and haptic object recognition. Psychonomic Bulletin & Review https://doi.org/10.3758/s13423-024-02471-x