Ching-Hsiu (Shaw) Hsu

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Summary

I am a researcher with more than six years of experience in leading end-to-end research to understand human behavior and cognition (with focus on learning, memory, and attention) by utilizing experimental and theoretical methods including behavior (in-person/online), neuroimaging, eye tracking, pupillometry, computational simulations, and mathematical theory across multiple projects.

Education

- **Stanford University** — Stanford, CA
  Ph.D., Biophysics — *2016 – 2022*
- **University of California, Berkeley** — Berkeley, CA
  B.A., Physics; B.A., Molecular and Cell Biology — *2011 – 2015*

Skills

- **Programming Languages**: Python, R, MATLAB, Javascript, HTML, SQL
- **Tools**: Python (numpy, scipy, pandas, matplotlib, scikit- learn, seaborn, Jupyter Notebook, Colab); R (Rmarkdown, tidyverse, ggplot, lme4, boot)
- **Statistical Expertise**: Multivariate regression; multilevel modeling; supervised and unsupervised classification; parametric and non-parametric statistics; cross-validation, bootstrap, permutation, and resampling methods; hypothesis testing

Experience

- **PhD Researcher** — 2016 - 2022
  Stanford Memory Lab, Stanford University — *Stanford, CA*
  - **Real-world applied research**: Applied bayesian multilevel analyses to compare the efficiencies of popular classroom learning strategies and found that self-quizzing with flashcards is more efficient than alternative learning methods at both the group (more efficient on >94% of samples) and individual (>72%) levels.
  - **Machine learning**: Applied machine learning algorithms to classify and predict human cognitive states from high-dimensional simultaneous multimodal electrophysiological, pupillometry, eye tracking, and behavioral data.
  - **Methodological research**: Characterized the psychometric properties of cross-sectional and longitudinal experimental designs using multivariate simulations and mathematical derivations.
  - **Longitudinal research**: Led large-scale online research to find that 29% of variance in memory behavior can be attributed to short-term day-to-day fluctuations in memory ability and performed statistical inference to show that this variance is significantly related to other cognitive processes.
  - **Collaborative research**: Collaborated with research groups in the schools of engineering (to develop portable electrophysiological devices), medicine (to understand memory functions in clinical populations), and education (to understand classroom learning).
  - **Communication**: Presented research at international conferences, published scientific manuscripts, and served as reviewer for scientific journals.
- **Research Intern** — 2016
  Mathematical Soft Matter Unit, Okinawa Institute of Science and Technology — *Okinawa, Japan*
  - **Fluid Mechanics**: Investigated the process of liquid droplet breakup due to fluid mechanical instability using ultra-high-speed camera systems and table-top experiments.

Honors

Stanford Interdisciplinary Graduate Fellowship ($100,000+), 2019-2022
Regents and Chancellor's Scholarship ($100,000+), 2011-2015
I.L. Chaikoff Memorial Award in Neurobiology, 2015