Tanya Wen

I am a quantitative researcher and with a cognitive science and psychology background. With over 12 years of research experience, I have analyzed data from online surveys, electrophysiological recordings, functional imaging, and eye-tracking. I am creative, resourceful, and perseverant in solving scientific problems using data and using analysis results to inform technology development and product decisions.

WORK EXPERIENCE

Applied Perception Scientist March 2024 – Present

Meta Reality Labs (contract via Magnit), Redmond, U.S.A

- Led the analysis and documentation of four KPI metrics for projects spanning our technology roadmap to evaluate user value.
- Analyzed data in Matlab and Python, including inferential statistics, signal detection theory, and linear mixed effects model to evaluate human subject data.
- Collaborated with cross-functional teams, supervised research assistants in initiating data collection of new studies, worked with SWEs to debug Unity Apps, discussed analysis and results with research scientists.

Research Scientist Oct 2022 – Present

Naval Health Research Center / Leidos, San Diego, U.S.A

- Cleaned, pre-processed, and analyzed EEG recordings in 50+ traumatic brain injury patients and healthy controls, utilizing ERP analysis and k-means clustering.
- Designed and programmed four different virtual reality (VR) tasks in Unity / C#, using Phidgets to collect sensor data, interact with hardware, and timestamp events.
- Wrote custom code to analyze data from wearable eye-tracker and infrared camera using computer vision algorithms in OpenCV and pre-trained neural networks (e.g., YOLOv8, Grounding DINO, and Segment Anything Model).

Postdoctoral Associate Oct 2019 – Oct 2022

Center for Cognitive Neuroscience, Duke University, U.S.A

- Demonstrated cognitive training and transfer learning in a series of three experiments using hierarchical Bayesian reinforcement learning models.
- Designed and published three innovative experiments to identify new phenomena in human cognition (transfer learning, temporal memory, and relative effort).
- Collected data from over 800+ participants on Amazon Mechanical Turk across 20+ web-based experiments that I programmed using JavaScript / HTML / CSS.
- Developed fMRI processing pipeline for the lab utilizing the Duke Compute Cluster with SLURM. Wrote Python scripts for conducting general linear models.

PhD Researcher Oct 2015 – Sept 2019

MRC Cognition and Brain Sciences Unit, University of Cambridge, United Kingdom

- Used support vector machine on MEG/EEG data to characterize the time-courses of five different components of selective attention.
- Characterized how the MD network responses to task difficulty when performance is limited by quality of data input across two experiments.

Undergraduate Research Assistant Oct 2011 – July 2015

National Cheng Kung University, Taiwan

- Led fMRI study investigating the neural correlates of the Flashed Face Distortion Effect illusion (supported with my research grant from the National Science Council).

CONTACT

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- *Social media:*
- linkedin.com/in/tanya-wen-phd/
- github.com/tanya-wen
- twitter.com/tanya_wen

SKILLS

Programming Languages:

- Python (Numpy, Pandas, SciPy, Scikit-learn, Matplotlib, Seaborn)
- MATLAB
- JavaScript / HTML / CSS
- Unity / C#
- Databases (SQL, MongoDB)
- R (lme4, tidyverse, ggplot2)

Statistical Analysis Skills:

- Inferential statistics (t-test, A/B test, ANOVA)
- Regression
- General Linear Model
- Exploratory data analysis
- Classification (logistic regression, SVM, ensemble methods, KNN)
- Unsupervised learning (PCA, k-means clustering)
- Time series analysis
- Graph theory
- Reinforcement learning
- Signal detection theory
- Power sample size analysis

Research Skills:

- Experimental design
- Hypothesis testing
- Online surveys/studies (MTurk)
- Virtual Reality
- Eye-tracking
- Participant recruitment
- Scientific writing

Other tools and skills:

- Microsoft Office
- Adobe Illustrator, Photoshop
- Git and Github
- Scientific writing, documentation

Languages:

- English
- Mandarin Chinese

- Used network-based statistics to characterize functional connections related to internet addiction.

CERTIFICATIONS

- Programming for Data Science with Python – Udacity Nanodegree
- The Complete 2023 Web Development Bootcamp – Udemy
- Foundations of eye tracking – Tobii Academy
- Unity Junior Programmer – Unity Technologies
- Basic Life Support (BLS) – American Heart Association

EDUCATION

PhD in Medical Science Oct 2015 – Sept 2019

MRC Cognition and Brain Sciences Unit, University of Cambridge, United Kingdom

- Link to thesis: https://www.repository.cam.ac.uk/handle/1810/300579
- Scholarship: Cambridge Commonwealth, European & International Trust

Bachelor of Science, Double Major Sept 2011 – May 2015

Department of Psychology, National Cheng Kung University, Taiwan
Department of Life Sciences, National Cheng Kung University, Taiwan

PUBLICATIONS

Wen, T., & Egner, T. (2023). Context-independent scaling of neural responses to task difficulty in the multiple-demand network. *Cerebral Cortex*, bhac479

Wen, T., Geddert, R.M., Madlon-Kay, S., & Egner, T. (2023). Transfer of learned cognitive flexibility to novel stimuli and task sets. *Psychological Science*, doi: 10.1177/09567976221141854

Wen, T. & Egner (2022). Retrieval context determines whether event boundaries impair or enhance temporal order memory. *Cognition*, 225, 105145

Wen, T., Duncan, J., & Mitchell, D.J. (2020). Hierarchical representation of multistep tasks in multiple-demand and default mode networks. *Journal of Neuroscience*, *40*(40), 7724-7738

Wen, T., Mitchell, D.J. & Duncan, J. (2020). The functional convergence and heterogeneity of social, episodic, and self-referential thought in the default mode network. *Cerebral Cortex*, *30*(11), 5915-5929

Wen, T., Duncan, J., & Mitchell, D. J. (2019). The time-course of component processes of selective attention. *NeuroImage*, 199, 396-407.

Wen, T., Mitchell, D. J., & Duncan, J. (2018). Response of the multiple-demand network during simple stimulus discriminations. *NeuroImage*, 177, 79-87.

Wen, T., Liu, D. C., & Hsieh, S. (2018). Connectivity patterns in cognitive control networks predict naturalistic multitasking ability. *Neuropsychologia*, 114, 195-202.

Lee, K. J., Hsieh, S., & Wen, T. (2017). Spatial Bayesian hierarchical model with variable selection to fMRI data. *Spatial Statistics*. doi: 10.1016/j.spasta.2017.06.002

Wen, T. & Hsieh, S. (2016). Network-based analysis reveals functional connectivity related to internet addiction tendency. *Front. Hum. Neurosci.* 10:6. doi: 10.3389/fnhum.2016.00006

Wen, T. & Hsieh, S. (2015). Neuroimaging of the joint Simon effect with believed biological and non-biological co-actors. *Front. Hum. Neurosci.* 9:483. doi: 10.3389/fnhum.2015.00483

Wen, T. & Kung, C. C. (2014). Using functional magnetic resonance imaging to explore the flashed face distortion effect. *Journal of Vision*, *14*(12), 29. doi:10.1167/14.12.29

FELLOWSHIPS & AWARDS

- Duke Interdisciplinary Behavioral Research Center Mini-Grant (2019-2020)
- Medical Research Council PhD Studentship (2018-2019)
- Taiwan Cambridge Scholarship (2015-2018)
- Guarantors of Brain Travel Grant (2018 & 2019)
- Percy Lander Studentship in Preventive Medicine (2017 & 2018)
- Ministry of Science and Technology Undergraduate Research Grant (2014 – 2015)
- National Science Council Undergraduate Research Grant (2013-2014)

WORKSHOPS

- CIFAR Winter School on the Neuroscience of Consciousness (2018)
- FSL course (2018)
- MEG UK workshop and annual conference (2017)
- York Centre for Vision Research (CVR) Vision Science Summer School (2014)

AD HOC REVIEWING

- NeuroImage
- Journal of Neuroscience
- Human Brain Mapping
- Neuroscience & Biobehavioral Reviews
- Scientific Reports
- European Psychiatry
- Frontiers in Psychology
- Frontiers in Human Neuroscience
- Neurobiology of Learning and Memory