Garrett Swan, Ph.D.

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A Pennsylvania State Cognitive Psychology PhD specializing in quantitative and qualitative human subjects research, with a focus on human performance and experience, eye tracking, and simulation. Conducted extensive research using psychophysics, computational and cognitive modeling, eye tracking, and driving simulation to test hypotheses. Highly experienced with experimental design, coding languages, modeling behavior, machine learning, and data science techniques.

EDUCATION

Pennsylvania State University, University Park, PA **August 2012 - May 2017**
Doctor of Philosophy (Ph.D.) in Cognitive Psychology
- Dissertation: Testing Predictions of the Binding Pool Model of Visual Working Memory

Syracuse University, Syracuse, NY **August 2011 - May 2012**
Doctor of Philosophy (Ph.D.) in Experimental Psychology - transferred with advisor to Penn State

North Carolina State University, Raleigh, NC **August 2007 - May 2011**
Bachelor of Arts (B.A.) in Psychology

PROFESSIONAL EXPERIENCE

Aptima, Inc., Woburn, MA **Nov 2022 - present**
Research Engineer / Senior Data Scientist
- Developed a study protocol (instructions, practice, between trial measures), interface, and GUI using Matlab (Psychtoolbox) for studies investigating how individual differences and workload impact ability to manage multiple unmanned vehicles

Cubic Defense Applications Inc., San Diego, CA **July 2021 - Nov 2022**
Cognitive Modeler / Senior Data Scientist
- Led projects evaluating how individuals multitask in high workload situations (AF-MATB), such as those experienced by pilots
- Created and tested a series of cognitive models using ACT-R that interact with the AF-MATB
- Developed pipeline in Python that extracted data from multiple datasets and used inferential statistics (model comparison, mixed-effect models, regression) to evaluate response behavior and eye-movement patterns of behavioral data and ACT-R simulations

University of California San Diego, La Jolla, CA **March 2020 - May 2021**
Lecturer (Non-Senate) in Computational Social Sciences
- Generated course content using Python libraries NumPy, Pandas, Matplotlib, Seaborn, Beautiful Soup, and SciKit-learn to web scrap, visualize, feature engineer, and model data using machine learning techniques (decision trees, linear and logistic regression, k-means clustering, and dimensionality reduction)

Schepens Eye Research Institute/Harvard Medical School, Boston, MA **June 2017 - May 2021**
Postdoctoral Research Fellow
- Led projects evaluating how vision impairment affects hazard detection in driving simulation (FAAC simulator)
- Created software and a GUI in Matlab that processed, visualized, and analyzed large volumes of driving simulator, virtual world, and eye tracking data for all experiments run in the lab across two separate driving simulators
- Collaborated with cross-functional team of engineers, psychologists, computer scientists, and optometrists

AWARDS

- **Envision Atwell award** **May 2019**
  - Award recognizes outstanding effort in vision research for a junior investigator
- **Alumni Association Dissertation Award** **Spring 2017**
  - Award provides funding and recognition to outstanding PhD students
- **NSF: East Asia and Pacific Summer Institute Award** **Summer 2015**
  - Awards PhD students first-hand experience to conduct research in East Asia and the Pacific

TEACHING EXPERIENCE

Instructor, University of California San Diego, Department of Psychology

- CSS 2: Data and Model Programming for Computational Social Sciences (Spring 2021: 33 students)
- PSYC 182: Illusions and the Brain (Winter 2021: 164 students)
- PSYC 174: Visual Cognition (Fall 2020: 50 students)
- CSS 2: Data and Model Programming for Computational Social Sciences (Summer 2020: 11 students)
- CSS 2: Data and Model Programming for Computational Social Sciences (Spring 2020: 42 students)

Instructor, Pennsylvania State University, Department of Psychology

- PSYCH 256: Introduction to Cognitive Psychology (Spring 2017: 150 students)
- PSYCH 256: Introduction to Cognitive Psychology (Fall 2016: 80 students)
- PSYCH 260: Neurological Bases of Human Behavior (Fall 2014, Spring 2015: 30 students)

SELECTED PEER-REVIEW PUBLICATIONS

- **Swan, G**., Stevens, C., Veksler, B., & Morris, M. (2024, June). Modeling fatigue in the N-back task with ACT-R and the fatigue module. Paper presented at Virtual MathPsych/ICCM 2024. Via mathpsych.org/presentation/1621.
- **Swan, G**., Stevens, C., & Klosterman, S. (2023, June). A Cognitive Model of the Effects of Workload on Perceptual Span. Paper presented at Virtual MathPsych/ICCM 2023. Via mathpsych.org/presentation/1288.
- **Swan, G**., Stevens, C., Fisher, C. R., & Klosterman, S. (2022, July). Exploring multitasking strategies in an ACT-R model of a complex piloting task. Paper presented at Virtual MathPsych/ICCM 2022. Via mathpsych.org/presentation/719
- **Swan, G**. et al. (2022). Change blindness in simulated driving in individuals with homonymous visual field loss. *Cognitive Research: Principles and Implications. 7*(1), 1-11
- **Swan, G**. et al. (2021). Driving with hemianopia VII. Predicting hazard detection with gaze and head scanning magnitude. *Translational Vision Science & Technology. 10*(1), 20
- **Swan, G**. et al. (2020). Automatic processing of gaze movements to quantify gaze scanning behaviors in a driving simulator. *Behavior Research Methods*, 1-20.
- **Swan, G**., et al. (2019). The effects of simulated acuity and contrast sensitivity impairments on detection of pedestrian hazards in a driving simulator. *TRP F: Traffic Psychology and Behavior, 64,* 213-226.
- **Swan, G**., et al. (2017). Working memory representations persist in the face of unexpected task alterations. *Attention, Perception, & Psychophysics*, *79*(5), 1408-1414.
- **Swan, G**., et al. (2016). Memory for a single object has differently variable precisions for relevant and irrelevant features. *Journal of Vision*, *16*(3), 32-32.
- **Swan, G**., et al. (2014). The binding pool: a model of shared neural resources for distinct items in visual working memory. *Attention, Perception, & Psychophysics*, 2136-2157.

SKILLS

- Computer languages — Matlab, Python, R, SPSS, HTML, CSS
- Other skills — Experimental design, ACT-R, psychophysics, Git, non-parametric and parametric statistics, creating GUIs, eye tracking