Samuel M. Taylor

Curriculum Vitae

EDUCATION

2022 - Present **Doctor of Philosophy, NSF GRFP Fellow (Ph.D)**
University of California, San Diego; San Diego, California
Field: Cognitive Science
Advisor: Dr. Benjamin Bergen

2016 - 2020 **Bachelor of Science, Magna Cum Laude, with Honors (B.S.)**
The University of Tulsa; Tulsa, Oklahoma
Majors: Computer Science; Mathematics
Minor: Psychology

RESEARCH EXPERIENCE

2022 - Present **Language and Cognition Lab**
University of California, San Diego; San Diego, CA
Position: Graduate Research Fellow
Supervisor: Dr. Benjamin Bergen
Conducted research on Large Language Models (LLMs), assessing LLMs as decision-making and artificial-intelligence systems using canonical psychological protocols. Data analysis and research conducted in Python and R.

2020 - 2022 **Laureate Institute for Brain Research**
Laureate Institute for Brain Research; Tulsa, OK
Position: Research Specialist
Supervisors: Dr. Martin Paulus, Dr. Ryan Smith
Data analysis in R, MATLAB, and Python. Working with fMRI, MRI, and behavioral data. Administering study and fMRI protocols. Developed and designed software for using computational models of psychological, psychiatric, and neurological data. Primarily worked with Bayesian decision-making models and generative-adversarial neural networks.

2019 (Summer) **Center for the Study of Language and Information**
Stanford University; Stanford, CA
Position: Research Intern
Supervisors: Dr. Daniel Lassiter, Dr. Chris Barker

Semantic parser development and analysis in Python. Worked with the NLλ type-logical grammar, derived from Lambek calculus.

2017 - 2020 **Computational Neuroscience and Adaptive Systems Laboratory**
The University of Tulsa; Tulsa, OK
Position: Research Assistant
Supervisor: Dr. Roger Mailler
Developed simulation software and path-planning algorithms in Java and Python for the navigation of simulated UAVs, under an Air Force Research Laboratory grant.

FUNDING

2022 - Present **National Science Foundation Graduate Research Fellow (NSF GRFP)**
Awarded the NSF GRFP in 2022, providing funding for 3 years of graduate program studies and research.
Amount awarded: $138,000

2019 **Stanford CSLI REU Research Stipend**
Stipend for summer research for semantic parsing of type-logical grammars as part of a summer NSF REU.
Amount awarded: $6,000

2017 **University of Tulsa Undergraduate Research Challenge**
Submitted and approved for funding for research over the summer to investigate A* and Kalman filters for dynamic and adversarial environments on simulated unmanned aerial vehicles (UAVs).
Amount awarded: $2,000

TEACHING EXPERIENCE

2023 **Teaching Assistant for Introduction to Python**
University of California, San Diego; San Diego, CA
Designed course materials, hosted office hours, graded coursework and exams, proctored tests, and ran in-person lab sessions for a 200+ student class covering Python, assuming no knowledge of programming.

2023 (Summer) **Teaching Assistant for Computational Social Sciences Bootcamp**
The University of California, San Diego; San Diego, CA

Designed course materials (Jupyter notebooks) and lectured incoming Masters students in Computational Social Sciences on how to use OpenAI's API for interacting with GPT-4 and the theory behind LLMs.

2019 **Teaching Assistant for Database System Design**
The University of Tulsa; Tulsa, OK
Assisted the professor by grading undergraduate students' projects and assignments, and proctoring exams.

PEER-REVIEWED PUBLICATIONS

Taylor, S., Lavalley, C. A., Hakimi, N., Stewart, J. L., Ironside, M., Zheng, H., White, E., Guinjoan, S., Paulus, M., Smith, R. (2023). Active learning impairments in substance use disorders when resolving the explore-exploit dilemma: A replication and extension of previous computational modeling results. *Drug and Alcohol Dependence*, 252, 110945. doi:10.1016/j.drugalcdep.2023.110945

Smith, R., Lavalley, C. A., **Taylor, S.**, Stewart, J. L., Khalsa, S. S., Berg, H., Ironside, M., Paulus, M. P. & Aupperle, R. (2023). Elevated decision uncertainty and reduced avoidance drives in depression, anxiety and substance use disorders during approach–avoidance conflict: a replication study. *Journal of Psychiatry & Neuroscience: JPN*, 48(3), E217–E231.

Smith, R., **Taylor, S.**, Stewart, J. L., Guinjoan, S. M., Ironside, M., Kirlic, N., Ekhtiari, M., White, E. J., Zheng, H., Kuplicki, R., Tulsa 1000 Investigators and Paulus, M. P. (2022). Slower Learning Rates from Negative Outcomes in Substance Use Disorder over a 1-Year Period and Their Potential Predictive Utility. *Computational Psychiatry*, 6(1), pp. 117–141.

Smith, R., **Taylor, S.**, Wilson, R. C., Chuning, A. E., Persich, M. R., Wang, S., & Killgore, W. D. S. (2022). Lower Levels of Directed Exploration and Reflective Thinking Are Associated With Greater Anxiety and Depression. *Frontiers in Psychiatry*, 12, 782136.

Smith, R., **Taylor, S.,** & Bilek, E. Computational Mechanisms of Addiction: Recent Evidence and Its Relevance to Addiction Medicine. *Curr Addict Rep,* 8, 509–519 (2021).

Smith, R., Mayeli, A., **Taylor, S.**, Al Zoubi, O., Naegele, J., & Khalsa, S. S. (2021). Gut inference: A computational modelling approach. *Biological Psychology*, 164, 108152.

Smith, R., Kirlic, N., Stewart, J. L., Touthang, J., Kuplicki, R., McDermott, T. J., **Taylor, S.**, Khalsa, S. S., Paulus, M. P., & Aupperle, R. L. (2021). Long-term stability of

computational parameters during approach-avoidance conflict in a transdiagnostic psychiatric patient sample. *Scientific Reports*, 11(1), 11783.

Alqahtani, S., Riley, I., **Taylor, S.**, Gamble, R., & Mailler, R. (2018, June). Task allocation in uncertain environments using a quadtree and flow network. *In 2018 International Conference on Unmanned Aircraft Systems (ICUAS)* (pp. 74-83). IEEE.

Alqahtani, S., **Taylor, S.**, Riley, I., Gamble, R., & Mailler, R. (2018, August). Predictive path planning algorithm using Kalman filters and MTL robustness. *In 2018 IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR)* (pp. 1-7). IEEE.

Alqahtani, S., Riley, I., **Taylor, S.**, Gamble, R., & Mailler, R. (2018, July). MTL Robustness for Path Planning with A*. *In Proceedings of the 17th International Conference on Autonomous Agents and MultiAgent Systems (AAMAS)* (pp. 247-255).

ORAL PRESENTATIONS

Taylor, S., Alqahtani, S., Mailler, R. (2018). Kalman filters to improve path-planning in adversarial, multi-agent environments. *Presented at the University of Tulsa Research Colloquium*. Tulsa, OK.

POSTERS

Claire Lavalley, **Samuel Taylor**, Anne E. Chuning, Sahib S. Khalsa, Robin L. Aupperle, Ryan Smith, 309. Combining Computational Modeling and High-Dimensional Latent Factor Analysis to Identify Biopsychosocial Correlates of Decision Mechanisms, *Biological Psychiatry, Volume 93, Issue 9, Supplement, 2023, Pages S218-S219*

HONORS AND AWARDS

2022 **National Science Foundation Graduate Research Fellow**
Awarded the NSF GRFP in 2022 to fund graduate studies and research.

2020 **Honors Program Graduate**
Awarded for completion of The University of Tulsa's Honors Program.

2019 **Goldwater Scholar**
Undergraduate research award from The Barry Goldwater Scholarship and Excellence in Education Foundation.

2017	**Phi Eta Sigma National Honor Society** Inducted into Phi Eta Sigma.
2016	**National Merit Finalist** Annual undergraduate scholarship for National Merit Finalist status. Awarded by the National Merit Scholarship Corporation.
2016	**University of Tulsa Vision Scholarship** Merit-based scholarship for University of Tulsa tuition.
2016	**Communities Foundation of Oklahoma Tulsa Engineering Scholarship** Merit-based scholarship for Tulsa, OK residents in STEM departments.