WAI KEEN VONG

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EMPLOYMENT

- Research Scientist, Human and Machine Learning Lab, New York University, September 2022–present.
 Advisor: Dr. Brenden Lake
- Postdoctoral Researcher, *Human and Machine Learning Lab*, New York University, 2019–August 2022.
 - Advisor: Dr. Brenden Lake
- Postdoctoral Researcher, Cognitive and Data Science Lab, Rutgers University–Newark, 2016–2019.
 - Advisor: Dr. Patrick Shafto

EDUCATION

- Doctor of Philosophy (Ph.D.), Psychology, University of Adelaide, 2013–2018.
 - Thesis: From simple to complex categories: How structure and label information guides the acquisition of category knowledge
 - Advisors: Dr. Danielle Navarro, Dr. Andrew Perfors and Dr. Andrew Hendrickson
- Bachelor of Psychology (First Class Honours), University of Adelaide, 2008–2012.
 - Thesis: Category learning in a dynamic environment
 - Advisors: Dr. Danielle Navarro and Dr. Andrew Perfors
- Bachelor of Mathematical and Computer Sciences (Pure Mathematics and Computer Science), *University of Adelaide*, 2009–2011.

PREPRINTS

- LeGris, S., **Vong, W. K.**, Lake, B. M., Gureckis, T. M. (2024). H-ARC: A Robust Estimate of Human Performance on the Abstraction and Reasoning Corpus Benchmark. arXiv preprint arXiv:2409.01374
- Tartaglini A. R., Feucht S., Lepori M. A., **Vong W. K.**, Lovering C., Lake B. M., Pavlick E. (2023). Deep Neural Networks Can Learn Generalizable Same-Different Visual Relations. arXiv preprint arXiv:2310.09612.

PUBLICATIONS

- Lepori, M. A., Tartaglini, A. R., **Vong, W. K.**, Serre, T., Lake, B. M., & Pavlick, E. (2024). Beyond the Doors of Perception: Vision Transformers Represent Relations Between Objects. *Advances in Neural Information Processing Systems (NeurIPS)*.
- Vong, W. K., Wang, W., Orhan, A. E., & Lake, B. M. (2024). Grounded Language Acquisition from the Eyes and Ears of a Single Child. *Science*, 383, 504-511.
- Wang, W., **Vong, W. K.**, Kim, N., & Lake, B. M. (2023). Finding Structure in One Child's Linguistic Experience. *Cognitive Science*.

- Ji, A., Kojima, N., Rush, N., Suhr, A., **Vong, W.K.**, Hawkins, R.D., and Artzi, Y. (2022). Abstract visual reasoning with tangram shapes. *Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP)*. **Best Long Paper Award**.
- Vong, W. K. and Lake, B. M. (2022). Few-shot image classification by generating natural language rules. *First Workshop on Learning from Natural Language Supervision, ACL* 2022.
- Radulescu, A., **Vong, W. K.**, and Gureckis, T. M. (2022). Name that state: How language affects human reinforcement learning. *Proceedings of the 44th Annual Conference of the Cognitive Science Society*.
- Tartaglini, A. R., **Vong, W. K.**, and Lake, B. M. (2022). A developmentally-inspired examination of shape versus texture bias in machines. *Proceedings of the 44th Annual Conference of the Cognitive Science Society*.
- **Vong, W. K.** and Lake, B. M. (2022). Cross-situational word learning with multimodal neural networks. *Cognitive Science*.
- Bass, I., Bonawitz, E., Hawthorne, D., **Vong, W. K.**, Goodman, N. D., and Gweon, H. (2022). The effects of information utility and teachers' knowledge on evaluations of under-informative pedagogy across development. *Cognition*.
- Yang, S. C. H., **Vong, W. K.**, Sojitra, R. B., Folke, T., and Shafto, P. (2021). Mitigating belief projection in explainable artificial intelligence via Bayesian Teaching. *Scientific Reports*.
- Johnson, A., **Vong, W. K.**, Lake, B. M. and Gureckis, T. M. (2021). Fast and flexible: Human program induction in abstract reasoning tasks. *Proceedings of the 43rd Annual Conference of the Cognitive Science Society.*
- Tartaglini, A. R., **Vong, W. K.**, and Lake, B. M. (2021). Modeling artificial category learning from pixels: Revisiting Shepard, Hovland, and Jenkins (1961) with deep neural networks. *Proceedings of the 43rd Annual Conference of the Cognitive Science Society.*
- **Vong, W. K.**, Hendrickson, A. T., Perfors, A. F. & Navarro, D. J. (2019). Do additional features help or harm during category learning? The curse of dimensionality in human learners. *Cognitive Science*.
- Yang, S.C-H.*, **Vong**, **W.K.***, Yu, Y., & Shafto, P. (2019). A unifying computational framework for teaching and active learning. *Topics in Cognitive Science*. (* indicates equal contribution)
- Vong, W. K.*, Sojitra, R.*, Reyes, A., Yang, S. C-H & Shafto, P. (2018). Bayesian teaching of image categories. *Proceedings of the 40th Annual Conference of the Cognitive Science Society*. (* indicates equal contribution)
- Yang, S.C-H., Yu, Y., Givchi, A., Wang, P., **Vong, W.K.**, & Shafto, P. (2018). Optimal Cooperative Inference. *Proceedings of the 21st International Conference on Artificial Intelligence and Statistics (AISTATS)*.
- Vong, W. K., Hendrickson, A. T., Perfors, A. F. & Navarro, D. J. (2016). Do additional features help or harm during category learning? An exploration of the curse of dimensionality in human learners. *Proceedings of the 38th Annual Conference of the Cognitive Science Society*. Marr Prize for Best Student Paper.
- Vong, W. K., Navarro, D. J. & Perfors, A. F. (2016). The helpfulness of category labels in semi-supervised learning depends on category structure, *Psychonomic Bulletin & Review*, 23, 230-238.
- Vong, W. K., Perfors, A. F. & Navarro, D. J. (2014). The relevance of labels in semi-supervised learning depends on category structure. *Proceedings of the 36th Annual Conference of the Cognitive Science Society*.
- Navarro, D. J., Perfors, A. F. & **Vong, W. K.** (2013). Learning time-varying categories. *Memory* & *Cognition*, 41, 917-927.

• Vong, W. K., Hendrickson, A. T., Perfors, A. F. & Navarro, D. J. (2013). The role of sampling assumptions in generalization with multiple categories. *Proceedings of the 35th Annual Conference of the Cognitive Science Society*.

INVITED PRESENTATIONS

- Cognitive Machine Learning (CoML) Seminar, École Normale Supérieure. April, 2024.
- Concepts and Categories Seminar (ConCats), New York University. March, 2023.
- Cognitive Tools Lab, University of California, San Diego. June, 2022.
- NUMBATS Seminar, Monash University. May, 2021.
- Language and Cognition Lab, Stanford University. March, 2021.
- Center for Data Science Seminar, New York University. October, 2019.
- Concepts and Categories Seminar (ConCats), New York University. December, 2017.
- Computation and Language Lab, University of Rochester. August, 2016.
- Computational Cognitive Neuroscience Lab, Harvard University. August, 2016
- Concepts and Categories Seminar (ConCats), New York University. August, 2016.
- Cognitive and Data Science Lab, Rutgers University Newark. August, 2016.

CONFERENCE PRESENTATIONS

- Vong, W. K., Wang, W., Orhan, A. E., & Lake, B. M. (2024). Grounded Language Acquisition from the Eyes and Ears of a Single Child. Presented as a poster at the *Philosophy of Deep Learning Conference* in New York, USA.
- Vong, W. K. and Lake, B. M. (2022). Few-shot image classification by generating natural language rules. Presented as a virtual poster at the *First Workshop on Learning from Natural Language Supervision, ACL 2022.*
- Radulescu, A., **Vong, W. K.**, and Gureckis, T. M. (2022). Name that state: How language affects human reinforcement learning. Presented as a poster at the *Proceedings of the 44th Annual Conference of the Cognitive Science Society*.
- Tartaglini, A. R., **Vong, W. K.**, and Lake, B. M. (2022). A developmentally-inspired examination of shape versus texture bias in machines. Presented as a talk at the *Proceedings of the 44th Annual Conference of the Cognitive Science Society*.
- Johnson, A., **Vong, W. K.**, Lake, B. M. and Gureckis, T. M. (2021). Fast and flexible: Human program induction in abstract reasoning tasks. Presented as a virtual poster at the 43rd Annual Conference of the Cognitive Science Society in Vienna, Austria.
- Tartaglini, A. R., **Vong, W. K.**, and Lake, B. M. (2021). Modeling artificial category learning from pixels: Revisiting Shepard, Hovland, and Jenkins (1961) with deep neural networks. Presented as a virtual poster at the 43rd Annual Conference of the Cognitive Science Society in Vienna, Austria.
- Vong, W. K., Orhan, A. E. and Lake, B. M. (2021). Cross-situational word learning from naturalistic headcam data. Presented as a virtual short talk at the *34th Annual CUNY Conference* on Human Sentence Processing.
- Johnson, A., **Vong, W. K.**, Lake, B. M. and Gureckis, T. M. (2021). Fluid and Flexible: Investigating Human Patterns of Novel Rule Induction in Abstraction Reasoning Tasks. Presented as a virtual talk at the *AAAI Symposium on Conceptual Abstraction and Analogy in Natural and Artificial Intelligence*.
- **Vong, W. K.** and Lake, B. M. (2020). Learning word-referent mappings and concepts from raw inputs. Presented as a virtual poster at the *42nd Annual Conference of the Cognitive Science Society* in Toronto, Canada.

- Vong, W. K.*, Sojitra, R.*, Reyes, A., Yang, S. C-H & Shafto, P. (2018). Bayesian teaching of image categories. Presented as a poster at the 40th Annual Conference of the Cognitive Science Society in Madison, USA.
- Sojitra, R., **Vong, W.K.** & Shafto, P. (2017). The dynamics of visual experiences. Presented as a poster at the *Cognitive Computational Neuroscience Conference* in New York City, USA.
- **Vong, W. K.**, Hendrickson, A. T., Perfors, A. F. & Navarro, D. J. (2016). Do additional features help or harm during category learning? An exploration of the curse of dimensionality in human learners. Presented as a talk at the *38th Annual Conference of the Cognitive Science Society* in Philadelphia, USA.
- Vong, W. K., Hendrickson, A. T., Perfors, A. F. & Navarro, D. J. (2016). Learning conceptual structure: How category labels affect learning and generalization in hierarchical and cross-cutting categories. Presented as a talk at the *Experimental Psychology Conference* in Melbourne, Australia.
- Vong, W. K., Hendrickson, A. T., Perfors, A. F. & Navarro, D. J. (2016). Overcoming the curse of dimensionality: How category structure affects the learning of complex categories. Presented as a talk at the *Australian Mathematical Psychology Conference* in Hobart, Australia.
- Vong, W. K., Hendrickson, A. T., Perfors, A. F. & Navarro, D. J. (2015). When more doesn't help: Learning categories with many features. Presented as a talk at the *Experimental Psychology Conference* in Sydney, Australia.
- Vong, W. K., Perfors, A. F. & Navarro, D. J. (2014). The relevance of labels in semi-supervised learning depends on category structure. Presented as a talk at the *36th Annual Conference of the Cognitive Science Society* in Quebec City, Canada.
- Vong, W. K., Hendrickson, A. T., Perfors, A. F. & Navarro, D. J. (2013). The role of sampling assumptions in generalization with multiple categories. Presented as a poster at the 35th Annual Conference of the Cognitive Science Society in Berlin, Germany.

AWARDS

- Best Long Paper Award, Empirical Methods in Natural Language Processing, 2022.
- Marr Prize (best student paper award), Cognitive Science Society, 2016.
- Student Travel Grant, Cognitive Science Society, 2016.
- Higher Degree Research Assistance Scheme, School of Psychology, University of Adelaide, 2014/2016.
- Australian Postgraduate Award, University of Adelaide, 2013–2016.
- Dean's Certificate of Merit, University of Adelaide, 2010.
- Summer Research Scholarship, University of Adelaide, 2009/2010.

RESEARCH EXPERIENCE

- Participated in the Summer School in Probabilistic Programming and Machine Learning, Portland, USA, 2016.
- Participated in the *Bayesian Modeling for Cognitive Science Workshop*, University of Amsterdam, Netherlands, 2013.
- Research Assistant, Dunn Lab, University of Adelaide, 2013–2014.
- Research Assistant, The Australian Centre for Visual Technologies, University of Adelaide, 2011–2012.
- Research Assistant, Computational Cognitive Science Lab, University of Adelaide, 2009–2012.

TEACHING EXPERIENCE

• Teaching Assistant, *Doing Research in Psychology*, School of Psychology, University of Adelaide, 2016.

• Teaching Assistant, *Computational Cognitive Science*, School of Computer Science, University of Adelaide, 2014.

ADVISING EXPERIENCE

- Ravi Sojitra (Rutgers, Postbac student, 2017–2019), now PhD student in Management Science at Stanford University
- Anderson Reyes (Rutgers, Undergraduate student, 2017–2019), now Software Engineer at Spotify
- Caroline Lee (Rutgers, Research Assistant, 2018–2019), now PhD student in Psychology at Columbia University
- Alexa Tartaglini (NYU, Undergraduate student, 2019–2024), now PhD student in Computer Science at Stanford University
- Wentao Wang (NYU, Master's student, 2021–2023), now PhD student at the Center for Data Science, New York University
- Daniel Tang (NYU, Master's student, 2021), now Research Technical Staff at the University of Tokyo
- Valerie Huang (NYU, Master's student, 2021)
- Qiwen Zhang (NYU, Master's student, 2023), now Data Scientist at Visa
- Manli Zhao (NYU, Master's student, 2023)
- Jiayue He (NYU, Master's student, 2023)
- Luyang Shang (NYU, Master's student, 2023)

SERVICE

- Co-organizer, CogSci workshop on "How does the mind discover useful abstractions?", July 2023.
- Organizer, NYU Concepts and Categories (ConCats) seminar, Fall 2020–Spring 2021.
- Member of the *Cognitive Science Society*.
- Ad-hoc reviewer for Cognitive Science, Cognition, Psychological Review, Journal of Memory and Language, Annual Conference of the Cognitive Science Society, American Journal of Psychology, Psychological Research, Journal of Memory and Language, Speech Communication, IEEE Transactions on Cognitive and Developmental Systems, Bridging AI and Cognitive Science Workshop (ICLR 2020), Large Language Models and Cognition Workshop (ICML 2024).

SKILLS

- Programming: Python, PyTorch, R, WebPPL, Javascript, HTML/CSS.
- Software: LATEX, Emacs, git, Bash, Unix.