Garrett Honke

Computational Neuroscientist
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Education

Binghamton University (SUNY)

PhD Cognitive and Brain Sciences 2012 - 2017

MSc Cognitive and Brain Sciences 2012 - 2015

University of Texas at Austin

BA Psychology 2004 - 2008

Positions

Staff Research Scientist, Google DeepMind 2025 - Present

Staff Research Scientist, Google Labs 2024 - 2025

Staff Research Scientist, X, the Moonshot Factory 2022 - 2024

Senior Research Scientist, X, the Moonshot Factory 2021 - 2022

Research Scientist, X, the Moonshot Factory 2019 - 2021

Research Scientist, New Knowledge 2018 - 2019

Postdoctoral Research Associate, Brain and Machine Laboratory 2017 - 2018
Co-appointment at the Watson School of Engineering and Applied Science and the Department of Psychology: Cognitive and Brain Sciences
Director: Dr. Sarah Laszlo; Binghamton University (SUNY)

Graduate Student, Brain and Machine Laboratory 2016 - 2017
Director: Dr. Sarah Laszlo; Binghamton University (SUNY)

Graduate Student, Learning and Representation in Cognition Laboratory 2012 - 2017
Director: Dr. Kenneth J. Kurtz; Binghamton University (SUNY)

Adult Lab Coordinator, Cognition and Language Laboratory 2010 - 2012
Director: Dr. Dedre Gentner; Northwestern University

Research Assistant, Similarity and Cognition Laboratory 2005 - 2007
Director: Dr. Arthur B. Markman; University of Texas at Austin

Publications and Presentations

Gemini Team (2025). Gemini 2.5: Pushing the Frontier with Advanced Reasoning, Multimodality, Long Context, and Next Generation Agentic Capabilities.

Niklaus, J., Zheng, L., McCarthy, A., Hahn, C., Rosen, B., Henderson, P., Honke, G., Liang, P., Manning, C. (2025). LawInstruct: A Resource for Studying Language Model Adaptation to the Legal Domain, NAACL

Kirchenbauer, J., Honke, G., Somepalli, G., Geiping, J., Ippolito, D., Lee, K., Goldstein, T., & Andre, D. (2024). LMD3: Language Model Data Density Dependence. CoLM 2024

Patterson, J. D., Snoddy, S., Honke, G., Premo, J., Silliman, D. C., Cavagnetto, A. R., & Kurtz, K. J. (2024). Improving concept learning in education via category construction. *Journal of Educational Psychology, 116*(8), 1455-1478.

Edwards, C., Lai, T. M., Ros, K., Honke, G., Cho, K., and Ji, H. (2022) Translation between Molecules and Natural Language. *Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing.* EMNLP 2022.

Honke, G., Higgins, I., Thigpen, N., Miskovic, V., Link, K., Duan, S., Gupta, P., Klawohn, J., & Hajcak, G. (2021). Representation learning for improved interpretability and classification accuracy of clinical factors from EEG. arXiv:2010.15274. ICLR 2021.

Cakmak, A. S., Thigpen, N., Honke, G., Alday, E. P., Rad, A, B., Adaimi, R., Chang, C. J., Li, Q., Gupta, P., Neylan, T., McLean, S. A., & Clifford, G. D. (2020). Using Convolutional Variational Autoencoders to Predict Post-Trauma Health Outcomes from Actigraphy Data. NeurIPS 2020 ML4MH workshop, accepted as a spotlight talk.

Honke, G., Kurtz, K. J., & Laszlo, S. (2020). Similarity Judgments Predict N400 Amplitude Differences between Taxonomic Category Members and Thematic Associates. *Neuropsychologia, 141*, 107388.

Kurtz, K. J., & Honke, G. (2020). Sorting out the problem of inert knowledge: Category construction to promote spontaneous transfer. *Journal of Experimental Psychology: Learning, Memory, and Cognition.46*(5), 803–821.

Dhamani, N., Azunre, P., Corcoran, C., Honke, G., Gleason, J. L., Kramer, S., & Morgan, J. (2019). Using Deep Networks and Transfer Learning to Address Disinformation. ICML 2019 AI for Social Good Workshop.

Honke, G. & Kurtz, K. J. (2019). Similarity is as Similarity Does? A Critical Inquiry into the Effect of Thematic Association on Similarity. *Cognition, 186*, 115-138.

Gentner, D., Simms, N., Kurtz, K. J., Honke, G., Snoddy, S., Forbus, K. D., Richland, L. E., Matlen, B. J., Lyons, E. M., & Klostermann, E. (2018). Relational Categories: Why they're Important and How they're Learned. In C. Kalish, M. Rau, T. Rogers, & J. Zhu (Ed.), *Proceedings of the 40th annual conference of the Cognitive Science Society* (pp. 27-28). Austin, TX: Cognitive Science Society.

Premo, J., Cavagnetto, A. R., Honke, G., & Kurtz, K. J. (2018). Categories in Conflict: Combating the application of an intuitive conception of inheritance with category construction. *Journal of Research in Science Teaching, 0*, 1-21.

Azunre, P., Corcoran, C., Sullivan, D., Honke, G., Ruppel, R., Verma, S., & Morgan, J. (2018). Abstractive Tabular Dataset Summarization via Knowledge Base Semantic Embeddings. arXiv:1804.01503 [cs.AI]. ICML 2018 AutoML workshop.

Honke, G. R., Conaway, N. B., & Kurtz, K. J. (2016). Switch it up: Learning categories via feature switching. In A. Papafragou, D. Grodner, D. Mirman, & J. Trueswell (Eds.), *Proceedings of the 38th annual conference of the Cognitive Science Society* (pp. 2693-2698). Austin, TX: Cognitive Science Society.

Gentner, D., Levine, S. C., Ping, R., Isaia, A., Dhillon, S., Bradley, C., & Honke, G. (2016). Rapid learning in a children's museum via analogical comparison. *Cognitive Science, 40*(1), 224-240.

Honke, G., Cavagnetto, A. R., Kurtz, K. J., Patterson, J. D., Conaway, N. B., Tao, Y., & Marr, J. C. (2015). Promoting Transfer and Mastery of Evolution Concepts with Category Construction. Paper presented at the American Educational Research Association annual meeting, Chicago, IL.

Gentner, D., Goldwater, M. B., Levine, S. C., Ping, R. M., Isiah, A., Honke, G., & Bradley, C. (2015). Spatial language and spatial comparison combine to support children's learning. *Cognitive Processing, 16*, S38-S38.

Patents

Please check Google Scholar

Invited Talks, Non-refereed Posters and Presentations

beta-VAE representation learning for real world psychopathology. Stanford MedAI

How I spent my summer vacation: Latin American Coldplay Bots take on MTV's Hottest. A primer on analytics for the detection and investigation of coordinated online disinformation campaigns. Texas Analytics Summit 2018, hosted by the Center for Research Analytics at the McCombs Schoool of Business, University of Texas at Austin.

Kurtz, K. J., Cavagnetto, A. R., Honke, G., Conaway, N. B., Patterson, J. D., Marr, J. C. & Tao, Y. (2014). Optimizing the category construction task to promote learning and transfer of knowledge in classroom instruction. In P. Bello, M. Guarini, M. McShane, & B. Scassellati (Eds.), *Proceedings of the 36th Annual Conference of the Cognitive Science Society.* Austin, TX: Cognitive Science Society.

Kurtz, K. J., & Honke, G. (2013). Self-generated analogies promote spontaneous transfer. Poster presented at the 54th annual meeting of the Psychonomic Society, Toronto, ON.

Honke, G., Gentner, D., Forbus, K., Cohen, C., Chang, M., Lovett, A., & Usher, J. (2012). Using CogSketch to support learning cross-sectional reasoning. Poster presented at the National Science Foundation site visit for the Spatial Intelligence and Learning Center (SILC). Philadelphia, PA.

Open Source Software

`reservoir_nn` is a package that enables the use of reservoir computing architectures in Keras. It enables the flexible creation of reservoir layers that can be used just like any other type of Keras layer. github

`SIMON`: a character-level CNN + LSTM for text classification. Transfer learn with the model to make inferences about class membership of text data, e.g., age prediction, spam classification, text similarity for arbitrary classes, etc. arXiv

CatLearn DIVA: the DIVergent Autoencoder implemented in `R` (2016). Available as a module in the `catlearn` `R` Package for computational modelling of formal psychological theories. `catlearn` is a framework and archive for distributed collaboration in formal modeling in psychology. r-forge

Wills, A. J., Edmunds, C. E., Kurtz, K. J., & Honke, G. A Practical Introduction to Distributed Collaboration for Formal Modeling: A Half-day Tutorial. Tutorial at the 50th Annual Meeting of the Society for Mathematical Psychology, University of Warwick, UK.

Catlearn Supplementals. `catlearn.suppls` is an `R` package that provides a suite of helper functions for cognitive modeling under the `catlearn` framework. github

Teaching

Research Methods — Fall 2017
Discussion Instructor

Statistical Analysis and Design — Summer 2017
Instructor

Experiment Psychology: Perception — Spring 2017
Teaching Assistant

Cognition Lab — Fall 2016
Instructor

Experimental Psychology: Cognition — Summer 2016
Instructor

General Psychology — Spring 2016
Teaching Assistant

Perception Lab — Fall 2015
Instructor

Experimental Psychology: Cognition — Fall 2012
Teaching Assistant

Ad Hoc Reviewing

Psychophysiology

PLOS One

Acta Psychologica

ICML

Behavorial Research Methods

Cognitive Science Society

Cognitive Processing

Cognitive Psychology

Journal of Experimental Psychology: Learning, Memory, and Cognition

Memory and Cognition

Psychological Science