

Philip Huebner

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PROFESSIONAL SUMMARY

I am a researcher with a background in machine learning, and human language acquisition. I am passionate about applying principles in cognitive science to improve interpretability and efficiency of machine learning systems.

EDUCATION

University of Illinois, Urbana-Champaign

PhD Candidate, 2018-current
Department of Psychology

University of Illinois, Urbana-Champaign

2019
Masters of Science in Psychology

University of California Riverside, Riverside

PhD Student, 2014-2018
Interdepartmental Neuroscience Graduate Program

University of California Davis, Davis

Class of 2014
Bachelor's of Science in Neurobiology, Physiology and Behavior

RESEARCH INTERESTS

Machine learning, cognitive theories, spectral methods, deep learning, Linux DevOps, NLP, interpretable AI

RESEARCH EXPERIENCE

Cognitive Computation Group, University of Pennsylvania

Collaborator, September 2018 - June 2021
Currently investigating representational capabilities of state-of-the-art neural language models trained on naturalistic language input.
Supervisor: Dan Roth, PhD; Cynthia Fisher, PhD

Language and Learning Lab, Department of Psychology, UIUC

Graduate Student Researcher, September 2015 - current
Currently investigating learning dynamics in neural language models.
Supervisor: Dr. Jon Willits, PhD

Bazhenov Research Group, UC Riverside

Rotation Student, July-August 2015

Worked with a postdoctoral student studying emergent properties of a model of the hippocampus implemented in MATLAB.

Supervisor: Dr. Maxim Bazhenov, PhD

Lechpammer Lab, Department of Pathology, UC Davis

Student Assistant, June 2013-September 2014

Assisted investigations of the effects of pharmacological interventions on behavioral development in rodent models of white matter stroke.

Supervisor: Dr Mirna Lechpammer, PhD, MD.

PUBLICATIONS

Mao S, Huebner, P. A, Willits, J. A. (in review) Compositional Generalization in a Graphical Distributional Model.

Mao S, Huebner, P. A, Willits, J. A. (in review) Spatial vs. Graphical Representation of Distributional Semantic Knowledge.

Huebner, P. A, Willits, J. A. (2021). Scaffolded input promotes atomic organization in the recurrent neural network language model. In Proceedings of CoNLL 2021.

Huebner, P. A, Willits, J. A. (2021). Using lexical context to discover the noun category: Younger children have it easier. *Psychology of Learning and Motivation*, 75

Huebner, P. A, Sulem, E., Fisher, C., Roth, D. (2021). BabyBERTa: Learning More Grammar With Small-Scale Child-Directed Language. In Proceedings of CoNLL 2021.

Huebner, P. A., Willits, J. A. (2018). Structured semantic knowledge can emerge automatically from predicting word sequences in child-directed speech. *Frontiers in Psychology*, 9, 133.

Fletcher, E., Raman, M., Huebner, P. A., Liu, A., Mungas, D., Carmichael, O., & DeCarli, C. (2013). Loss of fornix white matter volume as a predictor of cognitive impairment in cognitively normal elderly individuals. *JAMA neurology*, 70(11), 1389-1395.

Lechpammer, M., Clegg, M. S., Muzar, Z., Huebner, P. A., Jin, L. W., & Gospe Jr, S. M. (2014). Pathology of inherited manganese transporter deficiency. *Annals of neurology*, 75(4), 608-612.

INVITED TALKS

BabyBERTa: Learning More Grammar With Small-Scale Child-Directed Language. CoCoDev, Institute of Language, Communication, and the Brain. November 12, 2021. Virtual Talk via Zoom.

AWARDS

BabyBERTa: Learning More Grammar With Small-Scale Child-Directed Language.
Best Paper Award runner-up at CoNLL 2021.

Selected to attend NCSA Blue Waters GPU Hackathon .
September 10-14, 2018 at National Center for Supercomputing Applications, Illinois.

POSTERS

Predicting the Development of Semantic Knowledge From Child-Directed Speech.
58th Annual Meeting of Psychonomics Society
November 9-12, Vancouver, Canada.

Semantic Development in a Recurrent Neural Network, Symposium on Cognitive
and Language Development, May 13, 2017, University of California, San Diego.

A Recurrent Neural Network Model of the Development of Child Productive
Vocabulary. International Workshop on Language Production
July 25-27, 2016, La Jolla, California.

TEACHING

Co-developed the curriculum and instructor for BCOG 200
(Introduction to Programming for the Brain and Cognitive Sciences)
University of Illinois at Urbana-Champaign
Spring Semester, 2022.

Co-developed the curriculum and instructor for BCOG 100
(Introduction to Brain and Cognitive Sciences)
University of Illinois at Urbana-Champaign
Fall Semester, 2021.

Instructor for PSYCH 100 (Introduction to Psychology)
University of Illinois at Urbana-Champaign
Fall Semester, 2019 and 2020.

Teaching Assistant for PSYC 231 (Computational Modeling)
University of California, Riverside
Spring Quarter, 2017

Teaching Assistant for PSYC 12 (Introductory Statistics)
University of California, Riverside
Winter Quarter, 2017

Teaching Assistant for NRSC100 (Introductory Neuroscience)
University of California, Riverside
Summer, 2017

MENTORING

I have mentored a handful of undergraduate students by teaching them how to program, how to contribute to research projects, and become independent, confident scientists.

University of Illinois at Urbana Champaign, 2018-present.

COMMUNITY OUTREACH

Volunteer at Brain-Awareness Day, a research and outreach fair featuring a variety of booths and demos to raise awareness of neuroscience, UC Riverside, April 2016.

Webmaster, Neurobiology Physiology and Behavior Club, UC Davis, March 2013-2014.

CERTIFICATES

Machine Learning
Stanford Coursera Course taught by Dr. Andrew Ng

Positive Psychology
University of Pennsylvania Coursera Course taught by Dr. Martin Seligman

SKILLS

Scientific

- pyTorch
- tensorFlow
- pandas
- Python
- R
- LaTeX Report Writing and Data Visualization

NLP

- Language Modeling
- spacy
- nltk
- gensim
- huggingface

Web Development

- Flask
- SQL
- Javascript
- SQL

Information Technology

- Ubuntu Server Management
- Linux Command Line
- Git and Github