

COLEMAN HALEY

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EDUCATION

Bachelor of Science, Computer Science

Aug. 2016 – May 2020

Johns Hopkins University. GPA: 3.80

Secondary Major: Cognitive Science; Minor: Linguistics

RESEARCH & PROFESSIONAL EXPERIENCE

Microsoft Research

Remote

Contractor (Aquent L.L.C.)

Oct. 2020 – Present

Advise on morphological parsing solutions for segmentation in a machine translation project. Extend translation model to Inuktitut to show model's promise for morphologically rich languages.

Neuro-Symbolic Computation Lab (dir. Paul Smolensky)

Baltimore, MD

Research Assistant

Mar. 2019 – Present

Develop novel Tensor Product Representation-based vectorial representations of symbolic structure which are substantially more efficient for syntactic tree representation than prior methods. Extend this to allow for arbitrary symbolic computation over representations.

Phonology Lab (dir. Colin Wilson)

Baltimore, MD

Research Assistant

Sept. 2017 – Present

Develop an interpretable morphology learning neural network for diverse morphological typologies. Use semantic information to improve unsupervised morphological segmentation.

Jelinek Memorial Workshop on Speech and Language Technology (JSALT)

Montréal, CA

Undergraduate Researcher

June–Aug. 2019

Developed linguistically-motivated morpheme representations for neural language modelling and machine translation of low-resource languages with highly complex morphology (polysynthetic languages).

International Business Machines

San Jose, CA

Cognitive Software Development Intern

May – Aug. 2018

Create a visualization tool for evaluation metrics over time in a PDF-to-text-to-semantic-labels machine learning pipeline.

PUBLICATIONS & PRE-PRINTS

1. Park, H. H.; Zhang, K. J.; **Haley, C.**; Steimel, K.; Liu, H.; and Schwartz, L. Morphology Matters: A multilingual language modelling analysis. *To appear in Transactions of the Association for Computational Linguistics*.
2. **Haley, C.** and Smolensky, P. Invertible Tree Matrix Embeddings using a Cryptographic Role Embedding Scheme. *To appear at COLING 2020*
3. **Haley, C.** This is a BERT. Now there are several of them. Can they generalize to novel words? *To appear at BlackboxNLP 2020*.
4. Schwartz, L.; Tyers, F.; Levin, L.; Kirov, C.; Littell, P.; Lo, C.; Prud'hommeaux, E.; Park, H. H.; Steimel, K.; Knowles, R.; Micher, J.; Strunk, L.; Liu, H.; **Haley, C.**; Zhang, K.; Jimmerson, R.; Andriyanets, V.; Muis A. O.; Otani, N.; Park, J. H.; and Zhisong, Z. Neural Polysynthetic Language Modelling. Pre-print. <https://arxiv.org/abs/2005.05477>

TEACHING EXPERIENCE

Artificial Intelligence
Course Assistant

Johns Hopkins University
Spring 2020

Natural Language Processing
Course Assistant

Johns Hopkins University
Fall 2019

Introduction to Algorithms
Course Assistant

Johns Hopkins University
Spring 2019

Data Structures
Course Assistant

Johns Hopkins University
Fall 2017, Fall 2018

AWARDS, HONORS, & GRANTS

Provost's Undergraduate Research Award
Awarded for proposal for interpretable morphology learning neural networks (PI: Colin Wilson).

2019 – 2020

Michael R. Bloomberg Scholar
Scholarship for Johns Hopkins students demonstrating exceptional merit and financial need.

2016 – 2020

Omega Psi Honors in Cognitive Science
Awarded by the national undergraduate cognitive science society.

Spring 2018

OUTREACH

President, Omega Psi Inc.
National undergraduate cognitive science honor society. Create chapter retention and recruitment strategies. Work with chapters to refine and adapt honors membership requirements and build resources for honors members.

2019 – Present

Marketing Director, Out in STEM (oSTEM) at JHU
Create and design resources for LGBTQ+ college students navigating professional settings. Developed a recruitment strategy that increased club participation by more than 100%. Organized and promoted a university-wide student drag show for charity.

Dec. 2016 – Dec. 2019

Head of Design, HopHacks
Design promotional materials and create a consistent style for all communications for a biannual student-run hackathon. Contribute to the development and design of the organizational website.

Dec. 2017 – Dec. 2019

Editor, Charm City Stories
Build website and art submission system with Django backend and integrated with AWS S3 for submission storage for a narrative-medicine-themed art and writing magazine.

Sept. 2017 – Apr. 2019

SKILLS

Technologies: Python, PyTorch, C++, JavaScript, React, Java, C, Go, Django, SQL, HTML, CSS.
Languages: English (native), Japanese (high intermediate), German (intermediate).

COURSEWORK

Natural Language Processing: Natural Language Processing, Machine Learning: Linguistic and Sequence Modeling, Machine Translation.

Linguistics: Phonology I, Semantics I, Semantics II, Syntax I, Computational Psycholinguistics.

Computer Science: Algorithms, Probabilistic Graphical Models, Object-Oriented Software Engineering, Automata and Computation Theory, Artificial Intelligence, Machine Learning: Systems Design.

Mathematics: Probability and Statistics, Linear Algebra, Introduction to Abstract Algebra.