William Merrill

https://lambdaviking.com/

Last updated July 12, 2019

Research Interests

Natural language processing, computational linguistics, formal language theory, machine learning, neural data structures, parsing, historical linguistics

Professional Experience

AI2	2019–	**Research Resident** on AllenNLP team
Google	2018	**Software Engineering Intern** *"Exceeds expectations" rating; return offer*
Boston College	2017	**Research Intern** in Language Learning Lab
New York University	2013–2015	**Research Intern** in Morphology Lab

Education

Yale University	2015–2019	**B.S.** with distinction in Computer Science **B.A.** with distinction in Linguistics Thesis: Sequential neural networks as automata *Cum laude; note of excellence on thesis*

Teaching Assistant Experience

CPSC 477	Natural Language Processing	Spring 2019
CPSC 477	Natural Language Processing	Spring 2018
CPSC 470	Artificial Intelligence	Fall 2017

All courses were taught by Dragomir Radev at Yale

Awards and Grants

- DELFOL **student travel grant** presented by Naver Labs (2019)

- **Mellon grant** for senior thesis work, presented by Benjamin Franklin College at Yale University (2019)
- Buckley Program **open essay contest finalist** (2016)
- Yale College **freshman rap battle champion** (2016)
- **Rising scientist award** presented by the Child Mind Institute (2015)
- **National Merit Scholarship** letter of commendation (2013)
- **Study of American history award** presented by the Society of Mayflower Descendants (2013)
- National Latin Exam ***cum honore maximo egregio*** (2010)

Publications

William Merrill. Sequential neural networks as automata. *To appear at ACL Workshop Deep Learning and Formal Languages*, 2019.

William Merrill, Lenny Khazan, Noah Amsel, Yiding Hao, Simon Mendelsohn, and Robert Frank. Finding hierarchical structure in neural stacks using unsupervised parsing. *To appear at ACL Workshop BlackboxNLP*, 2019a.

William Merrill, Gigi Stark, and Robert Frank. Detecting syntactic change using a neural part-of-speech tagger. *To appear at ACL Workshop LChange*, 2019b.

Yiding Hao, William Merrill, Dana Angluin, Robert Frank, Noah Amsel, Andrew Benz, and Simon Mendelsohn. Context-free transductions with neural stacks. In Tal Linzen, Grzegorz Chrupała, and Afra Alishahi, editors, *Proceedings of the 2018 EMNLP Workshop BlackboxNLP: Analyzing and Interpreting Neural Networks for NLP*, pages 306–315, Brussels, Belgium, November 2018. Association for Computational Linguistics. URL `https://www.aclweb.org/anthology/W18-5433`.

Jungo Kasai, Robert Frank, Pauli Xu, William Merrill, and Owen Rambow. End-to-end graph-based TAG parsing with neural networks. In *Proceedings of the 2018 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, NAACL-HLT 2018, New Orleans,*

Louisiana, USA, June 1-6, 2018, Volume 1 (Long Papers), pages 1181–1194, 2018. URL https://aclanthology.info/papers/N18-1107/n18-1107.

William Merrill. A semantics of subordinate clauses using delayed evaluation. *Toronto Undergraduate Linguistics Conference*, 2018. URL https://ling.auf.net/lingbuzz/003487.

Invited Talks

BlackboxNLP	2018	*Context-free transductions with neural stacks*
Packer Symposium	2018	Neural networks, L2 acquisition, and the Voynich
CodeHaven	2018	Programming, language, and *The Book of Thoth*
TULCon	2018	*A semantics of subordinate clauses using delayed evaluation*

Blog Posts

- **Capsule networks for NLP**
- **Review: Learning to transduce with unbounded memory**
- **Word2vec analysis of the Voynich manuscript**

Selected Public Software

- **StackNN**: Differentiable stacks, queues, and dequeues in PyTorch
- **Voynich2Vec**: Word embedding analysis of the Voynich manuscript

Lab Affiliations

Computational Linguistics at Yale	2016–2019	*Robert Frank, Dana Angluin*
Language Learning Lab	2017	*Joshua Hartshorne*
Morphology Lab	2013–2015	*Alec Marantz*

Service

Yale Kitan Language Workshop	2016	Student workshop facilitator
Yale NACLO	2017	Student volunteer
Yale Tangut Language Workshop	2018	Student workshop facilitator

Selected Coursework

AI/NLP	Selected Topics in Neural Networks
	Advanced Natural Language Processing
	Computational Vision and Biological Perception
	Neural Networks and Language
	Natural Language Processing
	Deep Learning Theory and Applications
	Computing Meanings
CS Theory	Computational Complexity Theory
	Computability and Logic
	Systems Programming and Computer Organization
	Design and Analysis of Algorithms
	Data Structures and Programming Techniques
Linguistics	Syntax I
	Semantics I
	Phonology I
	Indo-European Linguistics
	Old English
	Hybrid Grammars
	Formal Foundations of Linguistic Theory
Math	Introduction to Analysis
	Vector Calculus and Linear Algebra I
	Vector Calculus and Linear Algebra II