

# William Merrill

<https://lambdaviking.com/>

*Last updated July 12, 2019*

## RESEARCH INTERESTS

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

## PROFESSIONAL EXPERIENCE

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AI2	2019–	<b>Research Resident</b> on AllenNLP team
Google	2018	<b>Software Engineering Intern</b> <i>“Exceeds expectations” rating; return offer</i>
Boston College	2017	<b>Research Intern</b> in Language Learning Lab
New York University	2013–2015	<b>Research Intern</b> in Morphology Lab

## EDUCATION

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Yale University	2015–2019	<b>B.S.</b> with distinction in Computer Science <b>B.A.</b> with distinction in Linguistics Thesis: Sequential neural networks as automata <i>Cum laude; note of excellence on thesis</i>
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## TEACHING ASSISTANT EXPERIENCE

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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*

## PUBLICATIONS

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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

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

## BLOG POSTS

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- **Capsule networks for NLP**
- **Review: Learning to transduce with unbounded memory**

- **Word2vec analysis of the Voynich manuscript**

## SELECTED PUBLIC SOFTWARE

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

## LAB AFFILIATIONS

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

## AWARDS AND GRANTS

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- **DELFOF 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)

## SERVICE

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

## SELECTED COURSEWORK

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<i>AI/NLP</i>	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
<i>CS Theory</i>	Computational Complexity Theory Computability and Logic Systems Programming and Computer Organization Design and Analysis of Algorithms Data Structures and Programming Techniques
<i>Linguistics</i>	Syntax I Semantics I Phonology I Indo-European Linguistics Old English Hybrid Grammars Formal Foundations of Linguistic Theory
<i>Math</i>	Introduction to Analysis Vector Calculus and Linear Algebra I Vector Calculus and Linear Algebra II