Rishi Bommasani

CONTACT INFORMATION

Department of Computer Science
Stanford University

https://rishibommasani.github.io
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RESEARCH INTERESTS

Natural language processing (NLP)
Interpretability, Social Bias, Fairness, Information Theory, Algorithms, Psycholinguistics, Cognition

EDUCATION

Stanford University, Palo Alto, California

Ph.D. Candidate, Computer Science, September 2020 – Present
Funding: National Science Foundation Graduate Research Fellowship

Cornell University, Ithaca, New York

M.S. Computer Science, August 2019 – May 2020
Thesis: *Generalized Optimal Linear Orders*
Advisor: Claire Cardie
Committee: Claire Cardie, Robert Kleinberg

Cornell University, Ithaca, New York

B.A. Computer Science, August 2016 – May 2019
B.A. Mathematics, August 2016 – May 2019

PEER-REVIEWED PAPERS

Rishi Bommasani, Kelly Davis, and Claire Cardie. Interpreting Pretrained Contextualized Representations via Reductions to Static Embeddings. *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics*, 2020.

Rishi Bommasani, Zhiwei Steven Wu, and Alexandra Schofield. Towards Private Synthetic Text Generation. *Machine Learning with Guarantees, collocated with NeurIPS*, 2019.

Rishi Bommasani. Long-Distance Dependencies Don't Have to Be Long: Simplifying through Provably (Approximately) Optimal Permutations. *Context and Compositionality in Biological and Artificial Neural Systems, collocated with NeurIPS*, 2019.

Rishi Bommasani and Claire Cardie. Towards Understanding Position Embeddings. *BlackboxNLP: Analyzing and Interpreting Neural Networks for NLP, collocated with ACL*, 2019.

Rishi Bommasani. Long-Distance Dependencies Don't Have to Be Long: Simplifying through Provably (Approximately) Optimal Permutations. *Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics: Student Research Workshop*, 2019.

Rishi Bommasani, Arzoo Katiyar, and Claire Cardie. SPARSE: Structured Prediction using Argument-Relative Structured Encoding. *Proceedings of the Third Workshop on Structured Prediction for NLP, collocated with NAACL*, 2019.

PAPERS UNDER REVIEW

Rishi Bommasani and Claire Cardie. Intrinsic Evaluation of Summarization Datasets. *Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing*, 2020. **Under Review**

THESIS

Rishi Bommasani. *Generalized Optimal Linear Orders*. M.S. Thesis, Cornell University, 2020.

HONORS AND AWARDS

Graduate Research Fellowship, National Science Foundation
Computer Science Prize for Academic Excellence and Leadership, Cornell University
Outstanding Teaching Assistant Award (6x), Cornell University

ACL Student Scholarship
NeurIPS Travel Grant
Mozilla Research Travel Grant
Phi Beta Kappa
Dean's List, Cornell University
Magna Cum Laude with Distinction in all Subjects, Cornell University

ACADEMIC RESEARCH

Cornell University, Ithaca, New York

Graduate Research Assistant **August 2019 – May 2020**

Undergraduate Research Assistant **March 2017 – August 2019**

- Building mathematically elegant estimators for social bias in word embeddings that naturally generalize to the multiclass setting; this work sheds light on prior inconsistencies in previous approaches to bias in word embeddings.
- Evaluating the quality of summarization datasets intrinsically to further the insightful selection of summarization datasets in downstream modeling and to provide greater understanding on the expected coverage of models trained on these datasets.
- Proposing the study of position embeddings with initial results showcasing that absolute position is encoded disparately across GPT and BERT. [Paper]
- Questioning the implicit and prevalent assumption throughout NLP of processing sentences with the word order imposed by the human author; demonstrating that word order can be exploited to encode additional information and that algorithmic optimization may be beneficial for some classes of computational models (LSTMs). [Paper]
- Adviser: Professor Claire Cardie

Research Assistant **December 2018 – December 2019**

Proposing the fundamental task of private synthetic text generation as an approach towards meaningfully unifying theoretical approaches to privacy (e.g. differential privacy) and empirical approaches to natural language processing. [Paper]

- Adviser: Professor Alexandra Schofield, *Harvey Mudd College*

NSF REU Undergraduate Researcher **May 2017 – September 2017**

Learning structured neural representations for relations and events by leveraging metadata annotations for a sparse structured prediction task; achieved state-of-the-art and substantially improved performance for models that do not require explicit feature engineering. [Paper]

- Adviser: Professor Claire Cardie

INDUSTRY RESEARCH

Mozilla Corporation, Mountain View, California

Research Intern **May 2019 - September 2019**

Introduced a lightweight distillation procedure to convert pretrained contextual word representations into static embeddings; yielding more lightweight representations that outperform Word2Vec and GloVe and are more appropriate for low-resource or time-constrained settings with a tremendous relative improvement in environmental and computational demands compared to GPT-2, BERT, RoBERTa, and XLNeDemonstrated these embeddings are more amenable to analysis with the most comprehensive study (to date) of social bias in word embeddings. [Paper]

- Adviser: Dr. Kelly Davis

Research Intern **May 2018 - September 2018**

Developed abstractive summarization systems using the `OpenNMT-py` framework that achieved SOTA performance on the Newsroom dataset; prioritized instances of genuine abstractivity.

- Adviser: Dr. Kelly Davis

Teaching Experience

Natural Language Processing (CS 5740) **January 2020 - May 2020**
Graduate Teaching Assistant

- Instructor: Professor Yoav Artzi

Natural Language Processing (CS 4740 / CS 5740) **August 2019 - December 2019**
Instructor, Graduate Teaching Assistant

- Co-taught senior undergraduate/graduate level course on natural language processing.
- Gave 8 lectures, all self-developed.
- Developed course projects and led the course staff.
- Recipient of Outstanding Teaching Assistant Award from Department of Computer Science
- Co-Instructor: Professor Claire Cardie

Honors Discrete Mathematics (CS 2802) **January 2019 - May 2019**
Head Teaching Assistant

- Recipient of Outstanding Teaching Assistant Award from Department of Computer Science
- Instructor: Professor Joe Halpern

Natural Language Processing (CS 4740 / CS 5740) **August 2018 - December 2018**
Head Teaching Assistant

- Recipient of Outstanding Teaching Assistant Award from Department of Computer Science
- Instructor: Professor Claire Cardie

Discrete Mathematics (CS 2800) **August 2018 - December 2018**
Teaching Assistant

- Recipient of Outstanding Teaching Assistant Award from Department of Computer Science
- Instructor: Professor Michael George

Discrete Mathematics (CS 2800) **January 2018 - May 2018**
Teaching Assistant

- Recipient of Outstanding Teaching Assistant Award from Department of Computer Science
- Instructor: Professor Michael George

Discrete Mathematics (CS 2800) **August 2017 - December 2017**
Teaching Assistant

- Recipient of Outstanding Teaching Assistant Award from Department of Computer Science
- Instructor: Professor Michael George

Leadership

Association for Computer Science Undergraduates **August 2017 - May 2020**
Academic Chair
Research Chair
Reading Group Lead

- Proposed and organized the inaugural iteration of CS Research Night which introduced 100+ undergrads to computer science research at Cornell (many undergrads became undergraduate researchers and REU participants). Further organized the second and third iterations.
- Designed and organized the first Computer Science Cornell Days which introduced Cornell Computer Science to admitted high school students. Modelled off of Ph.D. Visit Day.

- Organized all research activities, including a semester-long reading group which bridged paper-reading with survey-style lecturing to appeal to and to be accessible to younger students.
- Led reading groups on natural language processing and on machine learning. During one semester, the topic was interconnecting pre and post (deep learning) NLP while building up fundamentals for students with minimal linear algebra background. In the other semester, the topic was approachable Cornell NLP papers; the first paper I picked was from Gerry Salton!

SERVICE

Advised Research Students

Agnieszka (Aga) Koc	[B.A. CS, Cambridge University, 2019]
Software engineer at Google.	
Anna (Wei-An) Huang	[B.S. CS, Cornell University, 2021]
Albert Tsao	[B.S. CS, Cornell University, 2020]
M.S. CS at Cornell University.	
Julie Phan	[B.S. CS, Cornell University, 2020]
Joseph Kihang'a	[B.A. French, Cornell University, 2018]
Sabhya Chhabria	[B.A. CS, Cornell University, 2022]
Anusha Nambiar	[B.S. EE, Cornell University, 2022]
Han (Quintessa) Qiao	[B.S. CS, Cornell University, 2022]
Sabhya Chhabria	[B.A. CS, Cornell University, 2022]
Wenyi Guo	[B.S. CS, Cornell University, 2022]
Ye Jiang	[M.Eng. CS, Cornell University, 2020]

NLP Community Service

Conference Reviewer / Program Committee: ACL 2020, COLING 2020
Workshop Reviewer / Program Committee: ACL SRW 2020, RepL4NLP 2020
Other Roles: ACL SRW 2020 Mentorship Committee
Student Volunteer: NAACL 2019, ACL 2019
Secondary Reviewer: SPNLP 2019, ACL 2019, RepL4NLP 2019

Undergraduate Mentorship

Association for Computer Science Undergraduates (ACSU)
Women in Computing at Cornell (WICC)

Events

Cornell NLP Retreat Fall 2019, Cornell PhD Visit Days Spring 2020

LAST UPDATED

June 2, 2020