Chandra Sekhar Bhagavatula

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Research Interests

Natural Language Processing, Commonsense Reasoning, Deep Learning, Information Extraction, Information Retrieval

Work Experience

Allen Institute for Artificial Intelligence **Seattle, WA**
Senior Research Scientist, Mosaic *Jul 2019–Current*

- Counterfactual Reasoning
- Abductive Commonsense Reasoning
- Automatic Commonsense Knowledge Base Completion

Seattle, WA
Research Scientist, Semantic Scholar *Jun 2016–Jun 2019*

- Citeomatic: A state-of-the-art neural network model for content-based citation recommendation
- Entity Linking and Entity Extraction in Biomedical text using semi-supervised learning
- Claim Extraction from Scientific Research Documents

Allen Institute for Artificial Intelligence **Seattle, WA**
Research Intern, Semantic Scholar *Jun 2015–Sep 2015*

- Key Phrase Extraction system to find novel, informative key phrases from a scholarly article

Oracle Inc. **Burlington, MA**
Research Assistant Intern *Jun 2013–Sep 2013*
Matrix Factorization based techniques for relation extraction and relation inference in domain-specific text.

Amazon.com Inc **Seattle, WA**
Summer Intern - Software Development *Jun 2011–Sep 2011*
Built Machine Learning Models for Fraud Detection:

- To avoid circumvention of Amazon.com sales process due to diversion of transactions and users to a different website or sales process
- To identify products which contain prohibited ingredients

Yahoo! SDC **Bangalore, India**
Senior Software Developer *Jul 2008–Jul 2010*
Core responsibilities:

- Designed and developed highly available and scalable Ratings & Reviews platform.
- Worked on Yahoo! cloud technology for a new generation cloud based product called UGCCloud
- Developed APIs for the existing Ratings and Reviews platform used across all Yahoo! Portals to gather user reviews.
- Handled database migration of more than a few million user ratings data.

Education

Northwestern University **Evanston**
PhD, Computer Science, GPA – 3.78/4.0 *Sep 2011–Mar 2016*

National Institute of Technology **Allahabad, India**
Bachelor of Technology, GPA – 7.58/10.0 *Jul 2004–May 2008*
Computer Science and Engineering

PhD Thesis

Title: *Adding Structure to Unstructured and Semi-structured data*

- Methods for extracting structured knowledge from unstructured (e.g. text) and semi-structured (e.g. tables) data that can be used to populate knowledge bases

Publications

Keisuke Sakaguchi, Ronan Le Bras, Chandra Bhagavatula, and Yejin Choi. WINOGRANDE: An adversarial winograd schema challenge at scale. In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2020.

Maarten Sap, Ronan Le Bras, Emily Allaway, Chandra Bhagavatula, Nicholas Lourie, Hannah Rashkin, Brendan Roof, Noah A Smith, and Yejin Choi. Atomic: An atlas of machine commonsense for if-then reasoning. In *Proceedings of the AAAI Conference on Artificial Intelligence*, volume 33, pages 3027–3035, 2019.

Lianhui Qin, Antoine Bosselut, Ari Holtzman, Chandra Bhagavatula, Elizabeth Clark, and Yejin Choi. Counterfactual Story Reasoning and Generation. *arXiv preprint arXiv:1909.04076*, 2019.

Chaitanya Malaviya, Chandra Bhagavatula, Antoine Bosselut, and Yejin Choi. Exploiting structural and semantic context for commonsense knowledge base completion. *arXiv preprint arXiv:1910.02915*, 2019.

Lifu Huang, Ronan Le Bras, Chandra Bhagavatula, and Yejin Choi. Cosmos QA: Machine reading comprehension with contextual commonsense reasoning. *arXiv preprint arXiv:1909.00277*, 2019.

Lucy Lu Wang, Chandra Bhagavatula, Mark Neumann, Kyle Lo, Chris Wilhelm, and Waleed Ammar. Ontology alignment in the biomedical domain using entity definitions and context. *arXiv preprint arXiv:1806.07976*, 2018.

Chandra Sekhar Bhagavatula, Sergey Feldman, Russell Power, and Waleed Ammar. Content-Based Citation Recommendation. In *submission*, 2018.

Waleed Ammar, Dirk Groeneveld, Chandra Bhagavatula, Iz Beltagy, Miles Crawford, Doug Downey, Jason Dunkelberger, Ahmed Elgohary, Sergey Feldman, Vu Ha, et al. Construction of the literature graph in semantic scholar. *arXiv preprint arXiv:1805.02262*, 2018.

Matthew E Peters, Waleed Ammar, Chandra Bhagavatula, and Russell Power. Semi-supervised sequence tagging with bidirectional language models. In *ACL*, 2017, Citation Count: 5.

Waleed Ammar, Matthew Peters, Chandra Bhagavatula, and Russell Power. The AI2 system at SemEval-2017 Task 10 (ScienceIE): semi-supervised end-to-end entity and relation extraction. In *Proceedings of the 11th International Workshop on Semantic Evaluation (SemEval-2017)*, pages 592–596, 2017, Citation Count: 2.

Chandra Sekhar Bhagavatula, Thanapon Noraset, and Doug Downey. TabEL: Entity Linking in WebTables. In *ISWC*, 2015, Citation Count: 19.

Yi Yang, Doug Downey, and Jordan Boyd-Graber. Efficient methods for incorporating knowledge into topic models. In *EMNLP*, pages 308–317, 2015, Citation Count: 1.

Thanapon Noraset, Chandra Bhagavatula, and Doug Downey. Adding High-Precision Links to Wikipedia. In *EMNLP*, 2014, Citation Count: 11.

Chandra Sekhar Bhagavatula, Thanapon Noraset, and Doug Downey. TextJoiner: On-demand Information Extraction with Multi-Pattern Queries. 2014.

Thanapon Noraset, Chandra Bhagavatula, Yi Yang, and Doug Downey. Websail wikifier: English entity linking at TAC 2013. 2013, Citation Count: 4.

Doug Downey, Chandra Sekhar Bhagavatula, and Alexander Yates. Using natural language to integrate, evaluate, and optimize extracted knowledge bases. In *AKBC*. ACM, 2013, Citation Count: 3.

Chandra Sekhar Bhagavatula, Thanapon Noraset, and Doug Downey. Methods for exploring and mining tables on Wikipedia. In *Proceedings of the ACM SIGKDD Workshop on Interactive Data Exploration and Analytics*. ACM, 2013, Citation Count: 26.

Awards

2020: Outstanding Paper Award at AAAI2020

2012: NAACL scholarship to attend the JHU Summer School on Human Language Technology

2011: Placed 3rd at AEJMC 2011 Best of the Web contest for Team Innovation

2011: Winner at NUHackathon at Northwestern University

Computer Skills

Research Interests: Applying deep learning to NLP for commonsense understanding.

Frameworks: Tensorflow, Keras, PyTorch

Programming Languages: Python, JAVA, Scala, C++

Databases: MySQL

Other Academic Activities

Area Chair at ACL 2020

Served on the Program Committees of EMNLP 2019, IJCNLP 2017, NAACL 2016, EMNLP 2017, EMNLP 2014, ACL 2014, ICWSM 2013, NAACL-HLT 2013, EMNLP-CoNLL 2012