

# Yu Cao

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## PROFESSIONAL PROFILE

- Linguistics    Ph.D. student in linguistics specialized in computational linguistics, semantics, syntax-semantics interface, and discourse analysis. Strong critical-thinking and problem-solving skills.
- Computation    10+ years of experiences in algorithms and data structure. The First Prize in National Olympiad in Informatics in Provinces 2007, China.
- NLP/NLU        Research in how formal theories contribute to robust natural language processing. Coursework: [NLU and Computational Semantics](#), [Project Seminar: Linguistic Knowledge in Reusable Sentence Encoders](#) at NYU. [Graph formalisms for meaning representations](#) at NASSLLI 2018, CMU. Statistical NLP (Coursera), Machine Learning (Coursera), Introduction to Deep Learning ([Coursera](#)), Bayesian Methods for Machine Learning ([Coursera](#)).

## EXPERIENCE

- **Ontology Linguist Intern** 08/2019–10/2019  
Assistant Cross-Functional Group, Facebook (via PRO Unlimited)  
Prototyped models towards *universal semantic dependency* + *ontology* approach to cross-domain semantic parsing using PyTorch. Automated inferences and sub-ontology extraction in OWL 2 ontology knowledge graphs using Python.
- **Teaching Assistant/Course Instructor** 09/2018–08/2020  
Linguistics Department, Rutgers University  
Courses taught: *Introduction to Linguistic Theory*, *Invented Languages*.
- **Research Assistant** 12/2014–07/2015  
Center for Sign Linguistics and Deaf Studies, CUHK  
Provided linguistic expertise and assisted in developing a Chinese grammatical knowledge assessment software for deaf/hard of hearing children.

## EDUCATION

- **Ph.D. in Linguistics** 2016–present  
Rutgers University–New Brunswick
- **M.A. in Chinese Linguistics and Language Acquisition** 2013–2014  
The Chinese University of Hong Kong  
Dean's List. Best M.A. Thesis Award
- **B.A. in Teaching Chinese as a Foreign Language** 2009–2013  
Sichuan Normal University, China  
Distinguished Thesis Award

## PUBLICATIONS

- [Automated Fact-Value Distinction in Court Opinions](#) 2020  
*European Journal of Law and Economics*. With Daniel Chen and Elliot Ash.  
Automated classification of fact vs. value statements in written judicial decisions. Showed in application that the value segments are more informative of the ideological direction of U.S. circuit court opinions.
- [Investigating BERT's Knowledge of Language: Five Analysis Methods with NPIs](#) 2019  
*Proceedings of EMNLP 2019*. Equal contribution with Sam Bowman and 14 other authors.  
Team role: constructed and conducted the main transfer learning experiments.

## PROJECTS

- [Graph Representation of Meaning](#) ongoing  
Designed a graph based semantic representation that encodes plurality and quantification in natural language. Defined its model-theoretical interpreter. Developed a CCG-based graph construction mechanism (semantic parser).
- [Incremental topological sorting](#) 2017  
Designed algorithms for topological sorting under uncertain precedence conditions. Experimented with dynamic updating strategies that significantly improve on static topological sorting in time complexity.

## SKILLS

Machine learning modeling in NLP	Linguistic data analysis
Python, C, Matlab, PyTorch, Tensorflow, Scikit-learn	Statistics

## LANGUAGES

Mandarin (native), English (fluent), Japanese (working fluency; certified JLPT Level N1), Cantonese (limited fluency), French (beginner), Hong Kong Sign Language (beginner).