YULING GU

Seattle, WA • (+1)-917-945-2649 • yulinggu@uw.edu
https://yulinggu-cs.github.io/ • https://www.linkedin.com/in/yuling-gu/

PROFILE

I am a master's student in the Electrical and Computer Engineering department at the University of Washington. I have worked on a number of natural language processing projects focusing on commonsense reasoning, information extraction and speech processing. Drawing on an extensive background in linguistics, psychology, and computer science, I combine machine learning techniques with cognitive science in my research.

EDUCATION

University of Washington, Seattle, WA, USA — September 2020 - June 2022

- Master's in Electrical and Computer Engineering (Cumulative GPA: 4.0)
- Relevant Coursework: Statistical Learning, Continuous-Space Language Processing, Probability and Random Processes, Mathematical Foundations of Systems Theory

New York University, New York, NY, USA — August 2016 - May 2020

- Bachelor of Arts, *summa cum laude* (Cumulative GPA: 3.991)
- Double major: Computer Science with high honors, Language and Mind (Joint major in linguistics, psychology and philosophy); Minor: Mathematics
- Honors Thesis: "Towards detecting temporal relations implicitly conveyed in text"
  Advisor: Prof. Ernest Davis
- Relevant Coursework: Machine Learning for Language Understanding, Introduction to Machine Learning, Artificial Intelligence, Natural Language Processing, Theory of Computation, Numerical Computing, Operating Systems, Basic Algorithms, Computer Systems Organization, Data Structures, Discrete Mathematics, Linear Algebra, Calculus 3, Probability & Statistics, Statistics for The Behavioral Sciences, Sound and Language, Grammatical Analysis, Introduction to Semantics, Neural Bases of Language, Minds and Machines, Logic, Language and Mind, Perception, Cognition

TECHNICAL SKILLS

Computer Languages	Python, Java, R, MATLAB, Unix, C
Software & Tools	LaTeX, SPSS Statistics, Praat(for analysis of speech)
Natural Languages	Bilingual in English and Mandarin Chinese, Conversational Shanghainese

RESEARCH EXPERIENCE

***Research intern*: Allen Institute for AI (AI2)** — Summer 2021

- Working on the Aristo team, supervised by Dr. Bhavana Dalvi and Dr. Peter Clark. [Ongoing work] While language models (LMs) are good at question answering, they still struggle with situation-based questions. Human understanding of texts requires making use of information beyond what is explicitly stated in the text. We explicitly give models the information implicitly used by humans when processing texts through 1) filling in low-level details by (automatically) rewriting and elaborating the situation and 2) enabling models to dynamically learn about situations from the creative process of daydreaming. We propose a daydreaming framework to allow models to dynamically learn from imagined experiences, develop creative problem solving, and exploit useful interaction with emotions when dealing with scenarios. We then demonstrate how these techniques might enable LMs to better understand and answer situation-based questions.

Honors Thesis Project: Detecting temporal relations in text Spring 2019 - Spring 2020

· Supervised by Prof. Ernest Davis at New York University. Using various classifiers, word and sentence representations, as well as linguistics theories to automatically detect temporal relations implicitly conveyed in texts (different levels: from single event description to multiple sentences); Analyzing the performance of Transformer-based state-of-the-art models in detecting implicit meaning from a psycholinguistics perspective; Culminated in honors thesis "Towards detecting temporal relations implicitly conveyed in text".

Can dependency parsing help event extraction in text? Fall 2019 - Spring 2020

· Supervised by Prof. Ralph Grishman at New York University. Investigating the contribution of information from dependency parsing, Named Entity (NE) tagging, and Part Of Speech (POS) tagging in event extraction, beyond a baseline that uses pretrained BERT sentence representation.

Integrated Customization Environment for Information Extraction (ICE) Summer 2019

· Supervised by Prof. Ralph Grishman at New York University. Experimenting with different classifiers, together with grammatical linguistics insights, to automatically distinguish prepositional phrases as adjuncts or arguments (achieved 88% accurate prediction of the distinction using linguistics theories alone).

Termolator: A terminology extraction system (Open source tool) Summer 2018 - Fall 2018

· Supervised by Prof. Adam Meyers at New York University. Refining distributional metrics in the English Termolator; Further development of the Chinese Termolator; Integrated developments over the past 5 years to merge the Chinese and English Termolator as one unified system (my contributions: `https://github.com/yulinggu-cs/ChineseTermolator2020`, integrated to full system on July 2020).

Independent study project: Commonsense Reasoning Summer 2018

· Supervised by Prof. Ernest Davis at New York University. Looking at English-Chinese Machine Translation failures; Designing Winograd schemas and compiling pronoun disambiguation problems; Toward Annotating Commonsense Inferences in Text (TACIT). annotation

***Research intern*: Human Language Technology Group**
Institute for Infocomm Research, A*STAR, Singapore, Singapore Winter 2014 - Spring 2021

· Characterizing Singaporean, American, and British English acoustic and pronunciation patterns in children's speech using unsupervised clustering (supervised by Dr. Nancy F. Chen); Chinese tone perception in Singaporean and native Chinese Mandarin speakers; Investigating tone in whispered Mandarin (jointly supervised by Dr. Boon Pang Lim and Dr. Nancy F. Chen).

OTHER WORK EXPERIENCE

New York University (NYU) Spring 2019, Fall 2019

· Grader for Artificial Intelligence course at Courant Institute of Mathematical Sciences (CIMS) under Prof. Ernest Davis. (Fall 2019)

· Grader for Basic Algorithms course at Courant Institute of Mathematical Sciences (CIMS) under Prof. Victor Shoup. (Spring 2019)

PUBLICATIONS

Conference Papers:

Yuling Gu and Nancy F. Chen (2020). "Characterization of Singaporean Children's English: Comparisons to American and British Counterparts using Archetypal Analysis". *Proceedings of Interspeech 2020.* Presented at Interspeech 2020, Shanghai, China (virtual).

Yuling Gu, Boon Pang Lim and Nancy F. Chen (2016). "Perception of tone in whispered Mandarin sentences: the case for Singapore Mandarin". *Proceedings of Interspeech 2016.* Poster presented at Interspeech 2016, San Francisco, CA, USA.

Workshops/Abstracts:

Yuling Gu (2021). "Transformer-based language models and complement coercion: Experimental studies". *UnImplicit: The First Workshop on Understanding Implicit and Underspecified Language.* Poster presented at the UnImplicit workshop at ACL-IJCNLP 2021, Bangkok, Thailand (virtual).

Yuling Gu and Nancy F. Chen (2019). "Acoustic Characterization of Singaporean Children's English: Comparisons to American and British Counterparts". *Widening NLP workshop 2019.* Poster presented at WiNLP workshop at ACL 2019, Florence, Italy.

Yuling Gu and Nancy F. Chen (2019). "Large-scale acoustic characterization of mid-low vowels across American, British, and Singaporean children". *The Journal of Acoustical Society of America, Volume 146, Issue 4.* Poster presented at 178th Meeting of the Acoustical Society of America in San Diego, CA, USA.

Yuling Gu and Nancy F. Chen (2019). "Acoustic characterization of Singaporean children's English with American and British counterparts: A case study on approximants". *The Journal of Acoustical Society of America, Volume 146, Issue 4.* Poster presented at 178th Meeting of the Acoustical Society of America in San Diego, CA, USA.

In preparation:

Yuling Gu. Investigating Transformer-based language models' knowledge of hidden meanings (extension of UnImplicit workshop submission, in preparation for journal submission)

Yuling Gu and Nancy F. Chen. Large-Scale Acoustic Characterization of Singaporean Children's English: Comparisons to American and British Counterparts using Archetypal Analysis (in preparation for journal submission)

CONFERENCES

ACL-IJCNLP 2021, Bangkok, Thailand. (Virtual conference)

Interspeech 2020, Shanghai, China. (Virtual conference)

178th Meeting of the Acoustical Society of America in San Diego, California. (ASA travel grant, NYU Dean's Undergraduate Research Fund conference grant)

Represented NYU at 2019 Grace Hopper Celebration of Women in Computing in Orlando, FL, USA

ACL 2019, Florence, Italy. (WiNLP travel grant, NYU Dean's Undergraduate Research Fund conference grant)

Interspeech 2016, San Francisco, CA, USA. (ISCA travel grant)

AWARDS/HONORS

University of Washington

The Graduate School Top Scholar Research Assistantship Award (first year)

New York University

Phi Beta Kappa Honor Society (2020)

Faculty Memorial Award (Dean's Award Spring 2020)

Computer Science Prize for Academic Excellence in the Honors Program (Dean's Award Spring 2020)

University Honors Scholar (Spring 2020)

Four time recipient of Dean's Undergraduate Research Fund (Spring 2018 Individual Research Grant, Spring 2019 Individual Research Grant & 2 Conference Grants)

Bernice Nachman Marlowe Scholarship (Fall 2018 – Spring 2020)

Steffi Berne Scholarship (Fall 2018 – Spring 2020)

Dean's List for Academic Year (all 4 academic years)

Presidential Honors Scholars (Fall 2017 – Spring 2020)

Women In Science (WINS) Scholarship (Fall 2017 – Spring 2020)

External Grants

Acoustical Society of America travel grant (for 178th Meeting)

Widening NLP workshop at ACL travel grant (for ACL 2019)

ISCA travel grant (for Interspeech 2016)

EXTRA-CURRICULAR ACTIVITIES

Allen Institute for AI (AI2)

AI2 Hackathon (August 11-13, 2021)

New York University

NYU CAS alumni-student debate. The Motion: "The Benefits of the Development of Artificial Intelligence Outweigh the Harms." (October 26, 2019)

Women in Science visibility committee: liaison (Fall 2017 – Spring 2020)

Presidential Honors Scholars Program (Fall 2017 – Spring 2020)

League of Linguistics interest group (Fall 2017 – Spring 2020)

Dean's Honors Service Corps (Fall 2017 – Spring 2020)

Minority And Philosophy chapter (student organized interest group) (Spring 2017 – Spring 2020)