Jixuan Wang

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Research Interests

Areas: Machine learning and deep learning, meta-learning, transfer learning, graph neural networks, applications in speech and natural language processing (NLP)

I'm fascinated by the question: How can we build robust, flexible and high-performance AI that can have real-world impact? I'm especially interested in applications on conversational understanding, including speaker/speech recognition and natural language understanding. During my PhD, I built an AI enabled interface for clinical note-taking utilizing speech and NLP technologies (project website: http://www.phenopad.ai/).

Education

Sept. 2016 - Present	**University of Toronto**, Toronto, Canada PhD Candidate, Computer Science Advisers: Michael Brudno and Frank Rudzicz
Sept. 2014 - Jun. 2016	**Harbin Institute of Technology**, Harbin, China Master of Engineering, Software Engineering
Sept. 2010 - Jun. 2014	**Harbin Institute of Technology**, Harbin, China Bachelor of Engineering, Software Engineering

Working Experience

Sep. 2016 - Present	**University of Toronto**, Toronto, Canada Research Assistant, Affiliated with The Hospital for Sick Children - Led a team working on the PhenoPad project - Proposed a novel framework for clinical note-taking with mobile devices and AI - Developed speech and NLP technologies for conversational understanding - Developed a prototype and conducted user studies with clinicians and patients
Jun. 2020 - Dec. 2020	**Amazon Alexa**, Toronto, Canada Applied Scientist Intern, Mentors: **Kai Wei** and **Martin Radfar** - Worked on Transformer-based models for slot filling and intent detection - Proposed to enhance the model by syntactically-informed multi-task learning - Conducted experiments on both public and internal datasets - Wrote one paper and published it in AAAI 2021
Jun. 2019 - Sept. 2019	**Microsoft Research**, Redmond, US Research Intern, Mentor: **Xiong Xiao** - Worked on the EmpowerMD project, focusing on speaker diarization - Proposed to use graph neural networks for speaker diarization - Collaborated with the speech team of Microsoft on the project - Conducted experiments on both public and internal datasets - Wrote two papers and published them in ICASSP 2020 and Interspeech 2020

Peer-reviewed Publications

1. Taking off the training wheels: automatically disambiguating medical acronyms with ontology-aware deep learning.
   Marta Skreta, Aryan Arbabi, **Jixuan Wang**, Erik Drysdale, Jacob Kelly, Devin Singh, Michael Brudno.
   Accepted by *Nature Communications*

2. Encoding syntactic knowledge in transformer encoder for intent detection and slot filling.
   Jixuan Wang, Kai Wei, Martin Radfar, Weiwei Zhang, Clement Chung.
   AAAI 2021

3. Speaker attribution with profiles by graph-based semi-supervised learning.
   Jixuan Wang, Xiong Xiao, Jian Wu, Ranjani Ramamurthy, Frank Rudzicz, Michael Brudno.
   INTERSPEECH 2020

4. Speaker diarization with deep speaker embedding refined by graph neural networks.
   Jixuan Wang, Xiong Xiao, Jian Wu, Ranjani Ramamurthy, Frank Rudzicz, Michael Brudno.
   ICASSP 2020

5. Training without training data: Improving the generalizability of automated medical abbreviation disambiguation.
   Marta Skreta, Arbabi Arbabi, **Jixuan Wang**, Michael Brudno.
   Machine Learning for Health (ML4H) Workshop at NeurIPS 2019

6. Centroid-based deep metric learning for speaker recognition.
   Jixuan Wang[†], Kuan-Chieh Wang[†], Marc Law, Frank Rudzicz, Michael Brudno.
   ICASSP 2019

7. Customizable facial gesture recognition for improved assistive technology.
   Kuan-Chieh Wang, **Jixuan Wang**, Khai Truong, Richard Zemel.
   AI for Social Good Workshop at ICLR 2019

8. ERDS-exome: a hybrid approach for copy number variant detection from whole-exome sequencing Data.
   Renjie Tan[†], **Jixuan Wang**[†], Xiaoliang Wu, Liran Juan, Likun Zheng, Rui Ma, Qing Zhan, Tao Wang, Shuilin Jin, Qinghua Jiang, Yadong Wang.
   IEEE/ACM Trans Comput Biol Bioinform. 2017. doi: 10.1109/TCBB.2017.2758779.

9. Extending gene ontology with gene association networks.
   Jiajie Peng, Tao Wang, **Jixuan Wang**, Yadong Wang, Jin Chen.
   Bioinformatics. 2016. doi: 10.1093/bioinformatics/btv712.

Manuscripts Under Review

1. PhenoPad: building AI enabled note-taking interfaces for patient encounters.
   Jixuan Wang, Jingbo Yang, Haochi Zhang, Helen Lu, Marta Skreta, Mia Husic, Aryan Arbabi, Nicole Sultanum, Michael Brudno.
   Submitted to *npj Digital Medicine*

2. Grad2Task: Improved Few-shot Text Classification Using Gradients for Task Representation.
   Jixuan Wang, Kuan-Chieh Wang, Frank Rudzicz, Michael Brudno.
   Submitted to *NeurIPS 2021*

Awards and Honors

Jan. 2020	RBC Graduate Fellowship ($50,000 over 2 years)
Dec. 2019	C.C. Gotlieb (Kelly) Graduate Fellowship ($500)
May 2016 & May 2014	Outstanding Graduate of Harbin Institute of Technology
Nov. 2015	The Guanghua Educational Scholarship (2/61)
Dec. 2014	Outstanding Graduate Student Scholarship (Top 5%)

Other Affiliations

Sep. 2020 - Present	**University Health Network (UHN)**, Toronto, Canada Research Assistant at the DATA Team
Nov. 2017 - Present	**Vector Institute**, Toronto, Canada Research Student
Sep. 2016 - Present	**The Hospital for Sick Children**, Toronto, Canada Research Assistant at the Center for Computational Medicine

Teaching Experience

CSC411 **Machine Learning and Data Mining**, University of Toronto
Winter 2019, Winter 2018, Fall 2017, Winter 2017

CSC373 **Algorithm Design, Analysis and Complexity**, University of Toronto
Fall 2018, Summer 2017, Fall 2016

Technical Skills

Python (PyTorch, TensorFlow), Java, Bash Script