Fan **Jiang**

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Educations

The University of Melbourne   *Melbourne, Victoria, Australia*
PhD in Natural Language Processing   *Feb. 2022 - Feb. 2026 (expected)*
- Supervisors: Prof. Trevor Cohn & Prof. Tom Drummond

The University of Melbourne   *Melbourne, Victoria, Australia*
Master of Science (Computer Science) (with Distinction)   *Jul. 2019 - Jun. 2021*
- GPA: 91.9% (3.94/4.0) First Class Honours
- Supervisor: Prof. Trevor Cohn

Fuzhou University   *Fuzhou, Fujian, China*
Bachelor of Engineering in Software Engineering   *Sep. 2015 - Jun. 2019*
- GPA: 4.07/5.0 (Ranking: 1/155) Graduated with Honours

Research Interest

Natural Language Processing, focusing on Coreference Resolution and Information Retrieval.

Publications

EMNLP-Findings'23 — **Fan Jiang**, Qiongkai Xu, Tom Drummond and Trevor Cohn. 2023. **Boot and Switch: Alternating Distillation for Zero-Shot Dense Retrieval.** In Findings of the Association for Computational Linguistics (EMNLP).

EMNLP-Findings'23 — **Fan Jiang**, Tom Drummond and Trevor Cohn. 2023. **Noisy Self-Training with Synthetic Queries for Dense Retrieval.** In Findings of the Association for Computational Linguistics (EMNLP).

EACL'23 — **Fan Jiang**, Tom Drummond and Trevor Cohn. 2023. **Don't Mess with Mister-in-Between: Improved Negative Search for Knowledge Graph Completion.** Proceedings of the 17th Conference of the European Chapter of the Association for Computational Linguistics.

AAAI'22 — **Fan Jiang** and Trevor Cohn. 2022. **Incorporating Constituent Syntax for Coreference Resolution.** Proceedings of the 36th AAAI Conference on Artificial Intelligence.
URL: `https://doi.org/10.1609/aaai.v36i10.21329`

NAACL'21 — **Fan Jiang** and Trevor Cohn. 2021. **Incorporating Syntax and Semantics in Coreference Resolution with Heterogeneous Graph Attention Network.** Proceedings of the 2021 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies.
URL: `https://www.aclweb.org/anthology/2021.naacl-main.125`

Research Experience

The University of Melbourne   *Melbourne, Victoria, Australia*
Master Research Project: Coreference resolution incorporating constituent syntax.   *Dec. 2020 - June. 2021*
Student Research Assistant   Advisor: Prof. Trevor Cohn
- Proposed a novel method to effectively incorporate constituent parse trees to enhance a strong neural coreference resolution model by utilising graph attention networks.
- Achieved significant improvements over a strong baseline on the OntoNotes 5.0 English dataset and established new state of the art performance on the OntoNotes5.0 Chinese dataset.
- Research Outcome: One long paper accepted at AAAI 2022.

The University of Melbourne   *Melbourne, Victoria, Australia*
Master Research Project: Coreference resolution incorporating syntax and semantic roles   *Aug. 2020 - Nov. 2020*
Student Research Assistant   Advisor: Prof. Trevor Cohn

- Improved a strong neural coreference resolution model by incorporating dependency syntax and semantic role labels using heterogeneous graph attention networks.
- Observed significant improvements over a strong baseline on two standard coreference resolution benchmark datasets.
- Research Outcome: One short paper accepted at NAACL 2021.

Selected Projects

Twitter Link Prediction

- As part of the course project in Statistical Machine Learning subject, we built a model to predict pairwise relationships among node pairs in a partial crawl of the *Twitter Social Network*. A learning-based classifier is built through designing various topological features derived from graph structures, including first-order and higher-order features among node pairs.
- Our model achieves **91.38%** in the private leaderboard of in-class Kaggle competition and ranks **5** out of 132 teams.

End-to-end Speech Synthesis Method Based on Attention Mechanism (Bachelor's Thesis)

- Adopted Tacotron2 model (proposed by Google) as the mel-spectrogram generator, which is a recurrent sequence-to-sequence model with attention mechanism, and it can directly map the input text to spectrum extracted from original audio waveform. Most parts of the Tacotron2 Model were unchanged and the LSTM layers were changed into GRU ones since GRU can achieve almost the same performance as its LSTM counterparts but is computationally cheaper. A GRU layer was added to the decoder which takes current input of the decoder and contexts generated at previous time step as input before the attention layer.
- Adopted WaveNet as the neural vocoder. Use Gaussian Auto-Regressive WaveNet and Gaussian Inverse Auto-Regressive Flow based WaveNet which was trained through knowledge distillation as vocoders, respectively.

Hidden Markov Model based Chinese Singing Voice Synthesis System

- Implemented a Chinese singing voice synthesis system, which could be used to generate an audio in the form of WAV with arbitrary scores in the format of XML (Speech Parameter Generation Algorithm From HMM and Mel Log Spectrum Approximation (MLSA) filter for speech synthesis were implemented in this system).
- Implemented Probability Evaluation Algorithm (included the calculations of Forward and Backward probabilities), Baum-Welch Algorithm (Expectation Maximum Algorithm) and Viterbi Algorithm.
- Used HTK tools and a training set of 34 Chinese songs to train a model.

Skills

Programming Languages	C/C++, Java, Python
Deep Learning Framework	PyTorch, TensorFlow, Keras
Tools	J2EE, LaTeX, Makefile, Gcc
Database	MySQL, Microsoft SQL Server

Honors & Awards

Dean's Honours List 2021, Faculty of Science, The University of Melbourne	Aug. 2022
Outstanding Graduate of 2019 Academic Year, Fuzhou University	Jun. 2019
2nd Prize of 10th China Students Service Outsourcing Innovation and Entrepreneurship Competition	May. 2019
Merit Student of 2017-2018 Academic Year, Fuzhou University (Top 5%)	May. 2018
3rd Prize of Java Development University Group A, 9th Lan Qiao Cup China Software and IT Professionals	Apr. 2018
2nd Prize for Band C in 2016 National English Competition for College Students	May. 2016
Fuzhou University Scholarship (1st #2, 2nd #3, 3rd #1)	2015 - 2019

Language

IELTS	Overall: 7.5 (Listening: 8.5, Reading: 8.5, Writing: 6.5, Speaking: 6.0)
GRE	324 (Verbal: 154, Quantitative: 170)