

# JINJIE NI

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Research Fellow

School of Computing

National University of Singapore (NUS)

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## Research Interests

I study Large Language Models and Artificial General Intelligence. Previously, I was interested in improving the efficiency of general tasks and made some explorations in model compression and efficient modality alignment. I also spent much time improving conversational agents and unifying the dialogue system domain.

**Areas:** Large Language Models, Artificial General Intelligence, Machine Learning

## Experiences

### Academia

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|---|----------------|
| <b>National University of Singapore</b><br>Research Fellow at HPC-AI<br>- Research foundation models and their alignment. Work with Prof. You Yang.   | 2023 – present |
| <b>Nanyang Technological University</b><br>Ph.D. in Computer Science<br>- Thesis: Attention Mechanism Optimization for Sub-Symbolic-Based and Neural-Symbolic-Based Natural Language Processing | 2020 - 2023    |
| <b>Northwestern Polytechnical University</b><br>B.Eng. in Electrical Engineering<br>- Thesis: Multi-channel Estimator for Video-based Affective Computing                                       | 2016 - 2020    |

### Industry

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| <b>Research Intern at Alibaba Group, Singapore</b><br>DAMO Academy<br>- Researched modality alignment for explainable knowledge distillation. Worked with Dr. Yukun Ma and Dr. Bin Ma. | April 2022 – Oct 2022  |
| <b>Research Intern at Continental</b><br>Continental-NTU Corp Lab<br>- Researched fusing task-oriented and open-domain dialogue systems. Worked with Dr. Rui Mao.                      | Sept 2020 – March 2022 |
| <b>Research Intern at Chinese Academy of Sciences</b><br>Institute of Automation<br>- Researched anchor-free position estimation based on ExtremeNet and GCN. Worked with Dr. Sen Xin. | Feb 2020 – June 2020   |
| <b>Research Assistant at Harvard University</b><br>Institute for Applied Computational Science<br>- Developed VAE-GAN variants. Worked with Dr. Pavlos Protopapas.                     | Jan 2019 – March 2019  |
| <b>Research Intern at Chinese Academy of Sciences</b><br>Institute of Computing Technology<br>- Researched abstractive summarization. Worked with Dr. Shuai Jiao.                      | Oct 2018 – Nov 2018    |

## Selected Papers

### 2023

- **Jinjie Ni**, Rui Mao, Zonglin Yang, Han Lei, Erik Cambria. “Finding the Pillars of Strength for Multi-head Attention” In Proceedings of the Annual Meeting of the Association for Computational Linguistics (**ACL 2023**).
- **Jinjie Ni**, Yukun Ma, Wen Wang, Qian Chen, Dianwen Ng, Han Lei, Trung Hieu Nguyen, Chong Zhang, Bin Ma, Erik Cambria. “Adaptive Knowledge Distillation between Text and Speech Pre-trained Models” In Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (**ICASSP 2023**). Oral.

- Yukun Ma, Trung Hieu Nguyen, **Jinjie Ni**, Wen Wang, Qian Chen, Chong Zhang, Bin Ma. “Auxiliary Pooling Layer For Spoken Language Understanding” In Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (**ICASSP 2023**). Oral.
- Dianwen Ng, Ruixi Zhang, Jia Qi Yip, Zhao Yang, **Jinjie Ni**, Chong Zhang, Yukun Ma, Chongjia Ni, Eng Siong Chng, Bin Ma. “de’HuBERT: Disentangling noise in a self-supervised model for robust speech recognition” In Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (**ICASSP 2023**). Oral.
- Zonglin Yang, Xinya Du, Rui Mao, **Jinjie Ni**, Erik Cambria. “Logical Reasoning over Natural Language as Knowledge Representation: A Survey”, (**arXiv**).
- **Jinjie Ni\***, Rui Mao\*, Kai He\*, Xulang Zhang\*, Guanyi Chen\*, Zonglin Yang\*, Erik Cambria. “A Survey on Semantic Processing Techniques.” Information Fusion (**IF**), DOI:10.1016/j.inffus.2023.101988. (equal contribution)
- Chong Zhang, Dianwen Ng, Zhao Yang, **Jinjie Ni**, Jia Qi Yip, Yukun Ma, Chongjia Ni, Nguyen Trung Hieu, Eng Siong Chng, Bin Ma. “A Self- and Semi-supervised Learning Framework for Multilingual Speech Recognition”, (**arXiv**).

## 2022

- **Jinjie Ni**, Vlad Pandelea, Tom Young, Haicang Zhou, Erik Cambria. “HiTKG: Towards Goal-guided Conversations” In Proceedings of the AAAI Conference on Artificial Intelligence (**AAAI 2022**). Oral.
- Tom Young, Frank Xing, Vlad Pandelea, **Jinjie Ni**, Erik Cambria. “FusedChat: towards fusing task-oriented dialogues and chitchat in multi-turn conversational agents” In Proceedings of the AAAI Conference on Artificial Intelligence (**AAAI 2022**). Oral.
- Fuzhao Xue, Aixin Sun, Hao Zhang, **Jinjie Ni**, Eng Siong Chng. “An embarrassingly simple model for dialogue relation extraction” In Proceedings of the International Conference on Acoustics, Speech and Signal Processing (**ICASSP 2022**). Oral.
- Jiaxing Xu, **Jinjie Ni**, Sophi Shilpa Gururajapathy, Yiping Ke. “A Class-Aware Representation Refinement Framework for Graph Classification”, (**arXiv**).

## 2021

- **Jinjie Ni**, Tom Young, Vlad Pandelea, Fuzhao Xue, Erik Cambria. “Recent Advances in Deep Learning Based Dialogue Systems” Artificial Intelligence Review (**AIRE**), DOI: 10.1007 /s10462-022-10248-8.

## Teaching

<b>SC1003: Introduction to Computational Thinking and Programming</b> Teaching assistant for NTU undergraduate course	Aug 2021 – Dec 2021
<b>CE2100: Probability and Statistics for Computing</b> Lecturer for NTU undergraduate tutorial	Jan 2021 – May 2021
<b>CE1113: Physics for Computing</b> Teaching assistant for NTU undergraduate course	Aug 2020 – Dec 2020
<b>CZ2007: Introduction to Databases</b> Teaching assistant for NTU undergraduate course	Aug 2020 – Dec 2020
<b>CZ2004: Human Computer Interaction</b> Teaching assistant for NTU undergraduate course	Aug 2020 – Dec 2020

## Services

**PC Member:** ACL, EMNLP, AAAI, ICASSP

**Journal Reviewer:** Knowledge-Based Systems, Information Fusion, Artificial Intelligence Review, Cognitive Computation

**Co-organizer:** MLNLP community

**Lecturer:** GC & CAO Seminar

**Co-editor:** Lena’s NLP Course (Chinese Edition)

**Host:** 3<sup>rd</sup> MLNLP Seminar - Towards Generating Deep Questions from Text