Yuze **Gao**

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[Experience]

Aural & Language Intelligence (ALI) unit, The Institute for Infocomm Research(I^2R), Agency for Science, Technology and Research (A*STAR)
1 Fusionopolis Way, Singapore
(SENIOR) RESEARCH ENGINEER
Mar. 2019 – Present
> **Focus on:** Deep Learning-based applications for Natural Language Processing, work for **Dr. [Jian Su]**.

Natural Language Processing Lab, Singapore University of Technology and Design (SUTD)
Changi, Singapore
RESEARCH ASSISTANT
Sep. 2016 – Aug. 2018
> **Focus on:** Deep Learning-based applications for Natural Language Processing, work for **Prof. [Yue Zhang]**.

Natural Language Processing Lab, Northeastern University
Shenyang, China
RESEARCH ASSISTANT
Jul. 2014 – Apr. 2016
> **Focus on:** (Hierarchical) Phrase-based Statistical Machine Translation, work for **Prof. [Tong Xiao]**.

Yatrans Network Technology Co., Ltd.
Shenyang, China
RESEARCH ENGINEER
Sept. 2015 - Mar. 2016
> **Focus on:** Frame-based Statistical Machine Translation, work for **Prof. [Jingbo Zhu]**.

[Projects]

6. DECISION-MAKING IN CRITICAL URBAN SYSTEMS (DesCartes (A CNRS@CREATE PROGRAM))
The Institute for Infocomm Research(I2R) @ A*STAR   *Jan. 2022 - Jan. 2027*

National Research Foundation(Singapore::URL) and CNRS(French::URL) collaboration research. I participated in Workpackage 5 on the Text-to-SQL task, we also published an EMNLP Findings paper for this workpackage.

5. BAIDU I2R RESEARCH CENTRE (BIRC) STAGE 2 AND STAGE 3
The Institute for Infocomm Research(I2R) @ A*STAR   *April 2019 - Spet. 2023*

1) BIRC Stage 2 (2019.04 – 2020.09): Focus on the NER, Coreference-Resolution task, I am responsible for the specialized NER and Coreference-Resolution model for Baidu Music and Singapore localized NER.

2) BIRC Stage 3 (2020.10 – 2023.09): Focus on the Text-to-SQL task. Responsible for processing complex user queries. We delivered a 16% better performance(than the customer's expectation) model(deployed on Baidu's AI platform @ 2021.10). We further explored how to compress the complex model into a lightweight one and published an ACL Findings paper durning this stage.

4. CHINA CAPITAL MARKET AND UNSTRUCTURED DATA (CCMUD)
Singapore University of Technology and Design   *May 2018 - Aug. 2018*

CCMUD is a stock-related program for market predication. I worked on deep learning-based segmentation, named entity recognition, and sentiment analysis.

3. CROSS-FUNCTIONAL INFORMATION SYSTEMS FOR DECISION MAKING (CISDEM)
Singapore University of Technology and Design   *Oct. 2016 - Jun. 2018*

CISDeM is a cyber-information research program for decision-making against network security threats. I worked on the detection and clustering of events from streaming media. Analyzing these events to see whether they would pose a potential threat to the network infrastructure so that early countermeasures can be taken.

2. IMPROVING (HIERARCHICAL) PHRASE- AND FRAME-BASED STATISTICAL MACHINE TRANSLATION
Northeastern University   *Aug. 2014 - Mar. 2016*

This project aims to speed up the decoding process in the (hierarchical) phrase-based and frame-based statistical machine translation system while maintaining its BLUE(an index of the translation accuracy). Applying hard or soft constraints, such as derivation rules or grammatical structures, to direct its decoding progress.

1. The Design and Implementation of a Simple Teaching Compiler for C   *(Thesis Project)*
Northeastern University   *Mar. 2014 - Jun. 2014*

A teaching compiler for the course "Compiler Theory". It is to decompose the compiling elements and procedures, including lexical analysis results (token sequence, lexical analysis errors, and identifier list), syntax analysis (first set, follow set, select set, terminal symbol, non-terminal symbol, analysis steps, and forecasting analysis table), and translation results (intermediate language like quart expressions, symbol table, and the target assembly language).

[Publications & Patents]

Battle of the Large Language Models: Dolly vs LLaMA vs Vicuna vs Guanaco vs Bard vs ChatGPT - A Text-to-SQL Parsing Comparison @ [EMNLP 2023 Findings]
Shuo Sun, Yuchen Zhang, Jiahuan Yan, Yuze GAO, Donovan Ong, Bin Chen, Jian Su

An Exploratory Study on Model Compression for Text-to-SQL @ [ACL 2023 Findings]
Shuo Sun, **Yuze Gao**, Yuchen Zhang, Jian Su, Bin Chen, Yingzhan Lin, Shuqi Sun

Feature-Less End-to-End Nested Term Extraction @ [NLPCC 2019]
Yuze Gao, Yu Yuan

Learning How to Self-Learn: Enhancing Self-Training Using Neural Reinforcement Learning @ [IALP 2018]
Chenhua Chen, Yue Zhang and **Yuze Gao**

Cross-lingual Terminology Extraction for Translation Quality Estimation @ [LREC 2018]
Yu Yuan, **Yuze Gao**, Yue Zhang and Serge Sharoff

Implicit Syntactic Features for Targeted Sentiment Analysis @ [IJCNLP 2017]
Yuze Gao, Yue Zhang and Tong Xiao

A Comparison of Pruning Methods for CYK-based Decoding in Machine Translation @ [CWMT 2015]
Yuze Gao and Tong Xiao

Patents: Syntactic Skeleton-based Statistical Machine Translation System [2016]
CN201610053560.2, Yatrans Network Technology Co., Ltd
Co-inventor, with Tong Xiao, Jingbo Zhu, and Chunliang Zhang

[Education]

Northeastern University   *Shenyang, China*
B.Eng in Computer Science and Technology   *Sep. 2010 – Jun. 2014*
    Thesis: The Design and Implementation of a Simple Teaching Compiler for C

[Technical Skills]

Natural Language Processing:
- Proficient with: Statistical and Syntax-based Machine Translation, Deep Learning(**CNN/LSTM/GCN; Transformer: BERT/LLM**)-based Parsing, Sentiment Analysis, Coreference-Resolution and other applications(in **Enc-Dec/Decoder-only** architecture) for NLP.

Deep Learning Framework and Toolkits:
- Proficient with **PyTorch**; Familiar with **Tensorflow** (only use in 2017–2019 for deep learning).
- Familiar with Accelerate Tools like **DeepSpeed**, minimum (several times using) with **Megatron** and **Colossial AI**.

Programming Languages and Toolkits:
- **Language: Major::** C++, Python; **Minor::** Perl, Java, C#.
- **Toolkits:** GCC, GDB, GNU Make, Eclipse, PyCharm, CLion, Visual Studio Code(VScode)

[Academic Service]

2023: **Program Committee member** of IJCNLP-AACL 2023
2018: **Second Reviewer** of ICPCSEE 2018, **Second Reviewer** of NAACL-HLT 2018, EMNLP 2018.
2017: **Program Committee** of The 9th SIGHAN Workshop on Chinese Language Processing
2015: **Publishing Editor** of the Proceedings of the 11th China Workshop on Machine Translation (CWMT 2015)