

CHANGXIN KE

West Dazhi St. No.92, Harbin, China · ☎ (+86) 15997809381 · ✉ kcxain@gmail.com

🎓 EDUCATION

Harbin Institute of Technology (HIT), Harbin, China

2020 – Present

B. Eng in Artificial Intelligence, expected June 2024

GPA: 87.17 (the first five semesters)

Marks of some selected lessons:

Calculus 96, Linear Algebra 91, Probability Theory and Mathematical Statistics 88, High-level Language Programming(C language based) 94, Mathematical Logic 100, Design and Analysis of Algorithms 90.6, Discrete Mathematics 96, Introduction to Artificial Intelligence 97, Computer Architecture(CSAPP) 92

👥 RESEARCH & PUBLICATIONS

Research Center for Social Computing and Information Retrieval, HIT

Sep. 2022 – Present

Research Intern Under the guidance of Prof. Wei-Nan Zhang

Mainly focus on **Task Oriented Dialogue System** and **Simile Knowledge Mining**.

- Participate in the 11th Dialog System Technology Challenges (DSTC 11) Track-5 and rank 3rd under objective metrics, as the first author [1].
- Propose a high-quality multilingual simile dialogue dataset and design three simile tasks (recognition, interpretation, and generation). For each task, I conducted experiments using strong pre-trained models or state-of-the-art models and presented experimental results. The paper has been submitted to findings of ACL2023 [2].
- Two more papers were submitted to EMNLP2023. One is about **Knowledge-based Dialogue Generation**(the fourth author) [3] and the other is about **Simile Recognition and Generation**(the second author) [4].

Publications:

- [1] A Difference-aware Ensemble Method for Task-oriented Dialogue with Subjective
Changxin Ke, Churui Sun, Longxuan Ma, Wei-Nan Zhang, and Ting Liu. In Proc. of the Special Interest Group on Discourse and Dialogue (**SIGDIAL**)(Under Submission), 2023.
- [2] I run as fast as a rabbit, can you? A Multilingual Simile Dialogues Datasets
Longxuan Ma, Wei-Nan Zhang, Shuhan Zhou, Churui Sun, **Changxin Ke** and Ting Liu. In Proc. of the Annual Meeting of the Association for Computational Linguistics (**ACL**)(Findings, long paper), 2023.
- [3] (hidden due to double-blind review)
Longxuan Ma, Churui Sun, Weinan Zhang, **Changxin Ke**, Ting Liu. In Proc. of the Conference on Empirical Methods in Natural Language Processing (**EMNLP**)(Under Submission), 2023.
- [4] (hidden due to double-blind review)
Longxuan Ma, **Changxin Ke**, Shuhan Zhou, Churui Sun, Weinan Zhang, Ting Liu. In Proc. of the Conference on Empirical Methods in Natural Language Processing (**EMNLP**)(Under Submission), 2023.

♡ HONORS AND AWARDS

Rank 3rd, The 11th Dialog System Technology Challenges (DSTC 11) Track-5	2023
Top 3.8%, ACL Doc2dial Workshop in TIANCHI of Alibaba	2023
RenMin Scholarship, Twice	Harbin Institute of Technology, 2020 & 2022
Excellent Student, Twice	Harbin Institute of Technology, 2020 & 2021
First Prize, CUMCM	China Society for Industrial and Applied Mathematics, 2021
Second Prize, The Chinese Mathematics Competitions	Chinese Mathematical Society, 2021
(CUMCM is short for Contemporary Undergraduate Mathematical Contest in Modeling)	

⚙️ PROJECTS

Task-oriented Conversational Modeling with Subjective Knowledge Dec. 2022 – Apr. 2023

Participate in the DSTC 11 Track-5 and rank 3rd under objective metrics among all submitted teams worldwide.

- Divide the task into three stages: subjective knowledge detection, knowledge selection, and response generation. I use the **RoBERTa** model to sort the unstructured knowledge by relevance to select knowledge and concatenate them with context as input to the **T5** model to generate response.
- Use back-translation, synonym replacement, and knowledge splicing method to enhance data, and thus trained three different models. At last, I propose a **difference-aware ensemble method**, which helps us win the **first place** in the sub-task of subjective knowledge detection.

judou: A Chinese word segmentation module

Oct. 2022 – Present

Repository link: <https://github.com/kcxain/judou>

- Use **prefix dictionary** to construct the DAG graph of all possible word segmentation situations, and find the maximum probability word segmentation based on **Bi-gram** with **dynamic programming algorithm**.
- Mark the state of the word with the **Hidden Markov Model** to recognize the Out-of-vocabulary.
- It achieves **96.7** F1 score in the test set of *People's Daily* corpus which is much better than 93.2 of jieba (the most popular Chinese word segmentation module based on Uni-gram).

GradFlow: A simple deep learning framework with PyTorch-like API

Aug. 2022 – Present

Repository link: <https://github.com/kcxain/gradflow>

- Use **reverse accumulation method** which involves calculating the gradient from the outermost operation inwards to implement auto gradient.
- It implements forward and backward propagation of all common operations of Tensor (such as summation, broadcast_to).
- Implement a basic neural network library, including Module, Optimizer, Dataset abstract classes and common optimization algorithms & modules (such as SGD, Adam, BatchNorm1d, LayerNorm1d, Sequential).

👤 COMMUNITY WORK

GitHub and Zhihu contributor

Learning a lot of courses from famous computer schools, including CMU-15213: ICS, Stanford-CS224N: NLP with deep learning, etc., writing and publishing related collation, notes and code, one blog about the book *Computer Systems: A Programmer's Perspective*(CSAPP) has accumulated over **1.7k** likes and **6.4k** stars on Zhihu platform. One code repository of my solutions to the labs of CSAPP has received **70** stars in GitHub.

- Personal Website: <https://deconx.cn>
- Zhihu Profile: <https://www.zhihu.com/people/deconx>
- GitHub: <https://github.com/kcxain>

☰ SKILLS

- **Programming Languages:** Python, Java, C/C++, Rust
- **Tools for NLP:** PyTorch, HuggingFace-Transformers, Texar, NLTK
- **Other Tools:** Linux, Git, Shell, Anaconda, LaTeX
- **Language Skills:** CET-6 450, Chinese Native speaker