Ke Yang

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https://pangzike.github.io

EDUCATION

Washington University in St. Louis Sep 2023 – Present

- MS in Computer Science
- **GPA:** 4.0/4.0

Sun Yat-sen University, China Sep 2019- Jun 2023

- Bachelor of Engineering in Computer Science and Technology
- **GPA:** 3.8/4.0
- **Scholarship:** First-class Scholarship (top 5%, 2021)

PUBLICATION

Fanqi Wan, Weizhou Shen, **Ke Yang**, Xiaojun Quan and Wei Bi. Multi-Grained Knowledge Retrieval for End-to-End Task-Oriented Dialog. ACL 2023.

Weizhou Shen, Xiaojun Quan, and **Ke Yang**. Generic Dependency Modeling for Multi-party Conversion. International Conference on Acoustics, Speech, & Signal Processing, 2023.

RESEARCH EXPERIENCE

Text Entailment Generation and Prompt for NLI, UCInspire Program, UCI Jun 2022-Dec 2022

Research Intern *Supervisor: Prof. Ian G. Harris*

- Transfered the **NLI classification** task to **text entailment generation** task.
- Carried out experiments and find the model tend to summary the hypothesis instead of doing the real text entailment generation that requires the model to infer some new knowledge from hypothesis.
- Explored the problems commonly existing in the current NLI model such as wrong ground truth, classification on hypothesis only, classification on specific words.
- Used Prompt to tackle the NLI classification task, and use different unknown tokens as prompt answer space, achieve the better performance with the best score of our model higher than the current models by (F1 0.8)

Big Data and Computational Intelligence Institute, Sun Yat-sen University Apr 2021- June 2023

Group member *Advisor: Xiaojun Quan*

Research on Task-Oriented Dialogue System Based on LLM In-Context Learning

- Solved **task-oriented dialogue** (TOD) problems using the **ChatGPT** model combined with **In-Context Learning**.
- Proposed A diversity-based example selection method to better support In-Context Learning.
- Without any parameter tuning of the model, high-quality responses (F1 37.64) were successfully generated, and the generated responses exceeded some fine-tune models (e.g. DF-Net) in terms of evaluation indicators by (F1 2.74).
- Proposed the issue of current machine testing metrics overly relying on ground truth and ignoring multi-answers, so provided a testing metric based on entity similarity to address this issue.

Generic Dependency Modeling in Multi-Party Conversation

- Proved the importance of discourse parsing in **multi-party conversation** using the benchmark Molweni-MRC
- Proposed a simple and generic framework for modeling the dependency between utterances in a multi-party conversation to facilitate the understanding of conversation more precisely.
- Combined absolute dependency encoding and relative dependency encoding in Transformers, RoBERTa and BART for classification and generation tasks respectively, by modifying the computation of self-attention.
- Conducted span distance prediction pre-training to enhance the understanding of utterance dependency and give the model a proper initialization and compared it with MLM pre-train method.
- Improvement on four benchmarks of different tasks: MELD for utterance-level emotion classification (F1 1.91), DialogRE for relation extraction (F1 2.47), Molweni-MRC for reading comprehension (F1 2.50) and SAMSum for abstractive summarization in multi-party conversations (RougeL 1.45).

MASTER PROJECT

iOS Sidecar Networking App, Washington University in St. Louis Jan 2024-Jul 2024

Adviser: Prof. Patrick Crowley

- Developed and evaluated an iOS application using the Envoy Mobile proxy to connect iOS devices to a sidecar network.
- Created a HTTP proxy on iOS which can log all the HTTP connection.
- Provide **flexible name resolution at any node** of the overlay network path.

INTERNSHIP

State Key Laboratory of Pattern Recognition, Institute of Automation, CAS Jul 2022-Sep 2022

Advisor: Prof. Xibo Ma

- Monkey behavior recognition project.

TA EXPERIENCE

Fall 2024:

- TA of CSE 434S Reverse Engineering and Malware Analysis, WashU
- TA of CSE 523S Systems Security, WashU

Spring 2024:

- TA of CSE 523S Systems Security, WashU

COURSEWORK

Smart Kitchen Assistant Sep 2023- Dec 2023

https://github.com/salamczyk/Smart-Kitchen

- Developed a system that can detect all the required items for making oatmeal, as well as a subset of the potential distractors.
- Fine-tune a Yolov8 on our labeled dataset to detect the items, use a GPT-4 to generate voice prompt to guide user.
- 99% detection accuracy for all 11 required items and 5 distractors in real-time with good quality of voice prompt.

Multithreading t-SNE Jun 2022-Jun 2022

https://github.com/pangzike/Multithreading-TSNE

- Use GPU to accelerate the TSNE high-dimensional data visualization algorithm becoming 204 times faster.
- All iterative operations are performed in GPU.
- Solve the problem of insufficient precision of near zero float in denominator.

PROFESSIONAL SKILLS

Programming Languages: Python, C/C++, MIPS, x86, Verilog, Swift
Main-stream Programming Framework: PyTorch, MPI, OpenMP, OpenCL, Cuda, Steamlit
Database Managing: SQL Server
Other stuffs: Webots, Wireshark, LaTeX, Markdown, UML

EXTRACURRICULAR ACTIVITIES

Sun Yat-sen University Young Volunteers Association Apr 2021-Jun 2021

- Engaged in the voluntary after-school tutoring for children of migrant labors.

School of Computer Science and Engineering Student Union Sept 2019-Jul 2021

- Planned and organized diverse activities like opening ceremony of school sports games and coordinated flow of activities, personnel, rehearsals, and required materials, etc.