

PENG LI

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RESEARCH INTERESTS

My research interest lies mainly in **foundation models for robot learning**. The goal is to build general-purpose robots that can autonomously interact with the real world and continuously evolve. To achieve this goal, I am (1) enhancing the perception, reasoning/planning, control and learning capabilities of robots with existing language and vision foundation models; (2) designing and pretraining robotics-specific foundation models; (3) building new evaluation benchmarks.

EDUCATION

Fudan University

M.S., Computer Science

FudanNLP Group, Adviser: [Prof. Xipeng Qiu](#)

Shanghai, China

2021.09 – 2024.06 (*expected*)

East China Normal University

B.Eng. Data Science

NLP Group, Adviser: [Prof. Yuanbin Wu](#)

Shanghai, China

2016.09 – 2020.06

INTERNSHIP

The University of Hong Kong

Research Assistant

HKU NLP Group, Adviser: [Prof. Tao Yu](#)

Remote

2024.05 – Present

Toyota Technological Institute at Chicago (TTIC)

Visiting Student

TTIC NLP & Robotics Lab, Advisers: [Prof. Hongyuan Mei](#) and [Prof. Matthew R. Walter](#)

Chicago, U.S.

2023.05 – 2024.02

Shanghai AI Laboratory

Research Intern

InternLM Team, Advisers: [Dr. Hang Yan](#) and [Dr. Kai Chen](#)

Shanghai, China

2023.04 – 2023.06

PREPRINTS AND PUBLICATIONS

* indicates equal contribution.

- P1 **MANGO: A Benchmark for Evaluating Mapping and Navigation Abilities of Large Language Models**
Peng Ding*, Jiading Fang*, Peng Li*, Kangrui Wang*, Xiaochen Zhou*, Mo Yu, Jing Li, Matthew Walter, Hongyuan Mei
ArXiv 2024. ([ArXiv](#))
- P2 **Statler: State-Maintaining Language Models for Embodied Reasoning**
Takuma Yoneda*, Jiading Fang*, Peng Li*, Huanyu Zhang*, Tianchong Jiang, Shengjie Lin, Ben Picker, David Yunis, Hongyuan Mei, Matthew R. Walter.
ICRA 2024. ([ArXiv](#))
- P3 **MOSS: Training Conversational Language Models from Synthetic Data**
Tianxiang Sun, Xiaotian Zhang, Zhengfu He, Peng Li, Qinyuan Cheng, Hang Yan, Xiangyang Liu, Yunfan Shao, Qiong Tang, Xingjian Zhao, Ke Chen, Yining Zheng, Zhejian Zhou, Ruixiao Li, Jun Zhan, Yunhua Zhou, Linyang Li, Xiaogui Yang, Lingling Wu, Zhangyue Yin, Xuanjing Huang, Xipeng Qiu
★ MOSS is the first ChatGPT-like LLM in China, the first plugin-augmented LLM in China, and fully open-sourced with 11.9k+ stars.
Machine Intelligence Research 2024. ([Springer](#))
- P4 **CodeIE: Large Code Generation Models are Better Few-Shot Information Extractors**
Peng Li*, Tianxiang Sun*, Qiong Tang, Hang Yan, Yuanbin Wu, Xuanjing Huang, Xipeng Qiu.
ACL 2023. ([ArXiv](#))

RESEARCH EXPERIENCE

Toyota Technological Institute at Chicago (TTIC)

May 2023 – February 2024

TTIC NLP & Robotics Lab, Advisers: Prof. Hongyuan Mei and Prof. Matthew R. Walter

Chicago, U.S.

Statler: State-Maintaining Language Models for Embodied Reasoning

- Utilized a second LLM to simultaneously manage the status information of objects while employing a first codewriting LLM to write the robot’s policy code for decision-making tasks.
- The simulation and real-robot experimental results of three robotics tasks, namely “pick and place”, “block disinfection” and “weight reasoning”, indicate that its performance exceeds that of the Code-as-Policies method.

MANGO: A Benchmark for Evaluating Mapping and Navigation Abilities of Large Language Models

- Constructed the first benchmark to assess the mapping and navigation abilities of LLMs. Extracted walkthroughs from 53 interactive text-games and designed two types of questions to test these two capabilities of LLMs
- Evaluated the effectiveness of several black-box and open-source LLMs including ChatGPT, Claude, LLaMA, RWKV, and analyzed the influencing factors.
- Experiments also indicated that good mapping and navigation capabilities can help LLMs play text-based games more effectively.

Fudan University

May 2021 – Present

NLP Group, Adviser: Prof. Xipeng Qiu

Shanghai, China

MOSS: China’s First ChatGPT-like Large Language Model

- Participated in the design and implementation of the open-source tool-augmented 16B conversational language model “MOSS” as a core member.
- Helped prepare the training data for the first version of MOSS. The goal was to make MOSS helpful, honest and harmless (HHH).
- Augmented MOSS with external tools like the search engine, calculator, text2image tools etc. These tools enable MOSS to access up-to-date information, have better mathematical skills, have the ability to produce images and so on.
- Responsible for processing sensitive data in conversations with MOSS.

CodeIE: Utilizing Code-LLMs for Better Few-Shot Information Extraction

- Proposed to utilize Code-LLMs like Codex with structured code-format prompts to perform structured few-shot information extraction tasks.
- Designed concrete code-format prompts for the few-shot NER and RE tasks. Then prompted OpenAI’s code-davinci-002 model with in-context demonstrations to perform these IE tasks.
- Experimental results on seven benchmarks show that our method consistently outperforms fine-tuning moderate-size pre-trained models specially designed for IE tasks (e.g., UIE) and prompting NL-LLMs (e.g., GPT-3) under few-shot settings.
- Further conducted a series of in-depth analyses to demonstrate the merits of leveraging Code-LLMs for IE tasks.

SERVICES

Reviewer	
EMNLP	2021-2023
ICRA	2024
Teaching Assistant	
Pattern Recognition and Machine Learning under Prof. Xipeng Qiu	2022-2023
Introduction to Artificial Intelligence under Prof. Xipeng Qiu	2022
Statistical Natural Language Processing under Prof. Yuanbin Wu	2021

SKILLS

Programming: Python, C/C++, LaTeX; Scikit-learn, PyTorch

Language: English, Mandarin