HAOFEI HOU

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EDUCATION

Huazhong University of Science and Technology   **Sept 2020 – Jun 2024**
*School of Software Engineering, Software Engineering - **93.87** - (1/120)*   *Wuhan, Hubei*

Peking University   **Sept 2024 – Present**
School of Mechanics and Engineering Science, Mechanical Engineering   *Beijing*

PUBLICATIONS

BioPIE: A Biomedical Protocol Information Extraction Dataset for High-Reasoning-Complexity Experiment Question Answer ⬀   **01 2026**

- **Haofei Hou***, Shunyi Zhao*, Fanxu Meng*, Kairui Yang, Lecheng Ruan, Qining Wang (Equal contribution*).
- We introduce Biomedical Protocol Information Extraction Dataset (BioPIE), a dataset that provides procedure-centric KGs of experimental entities, actions, and relations that supports reasoning over biomedical experiments.
- We evaluate information extraction methods on BioPIE, and implement a QA system that leverages BioPIE, showcasing performance gains. *Under submission to ACL'26*

Linear Temporal Logic Translation via Human-Inspired Self-Constrained Reinforcement Learning   **09 2025**

- Fanxu Meng*, **Haofei Hou***, Kairui Yang, Mengchen Cai, Lecheng Ruan, Qining Wang (Equal contribution*).
- We proposed an framework for translating natural language instructions into LTL specifications by integrating SCFGs extracted from parallel corpora into a reinforcement learning loop.
- Demonstrated significant improvements in accuracy and generalization over state-of-the-art LLM-based RAG and fine-tuned models across multiple robotic planning benchmarks, with human evaluations confirming enhanced trust and comprehensibility. *Under submission to IJRR*

Expert-level protocol translation for self-driving labs ⬀   **09 2024**

- Yu-Zhe Shi*, Fanxu Meng*, **Haofei Hou***, Zhangqian Bi, Qiao Xu, Lecheng Ruan, Qining Wang (Equal contribution*).
- We automate the protocol translation process through a three-stage workflow.
- We incrementally construct Protocol Dependence Graphs (PDGs) that approach structured in the syntax level, completed in the semantics level, and linked in the execution level. *NeurIPS'24*

AutoDSL: Automated domain-specific language design for structural representation of procedures with constraints ⬀   **05 2024**

- Yu-Zhe Shi*, **Haofei Hou***, Zhangqian Bi, Fanxu Meng, Lecheng Ruan, Qining Wang (Equal contribution*).
- We automate DSL-based action constraint design across protocols from various domains
- Constraints include syntactic constraints and abstracts semantic constraints.
- Quantitative and qualitative analyses of the DSLs highlights its potential as an auxiliary module for language models, aiming to improve procedural planning and execution. *ACL'24*

PROJECTS

A Marker-Free Motion Capture System Built on Unsynchronized Cameras ⬀   **09 2024**

- We propose a marker-free MoCap system that is built on unsynchronized cameras. Our system introduces two crucial components: multi-view temporal post-processing and temporal augmentation training .

Prosthetic Control by Learning: A Multi-Agent Cooperative Game Framework ⬀   **04 2024**

- We develop a model-free reinforcement learning framework that enables the prosthesis to adapt to diverse human movement patterns through cooperative policy learning.

Abductive task abstractions in physical problem-solving | CoCoSci, Meta-RL, Web   **10 2022**

- Web-based game development: Built an interactive web-based problem-solving game environment (ProbSol) for studying task abstraction under controlled goals and constraints.
- Human behavioral experiments: Designed and conducted human-subject experiments.
- Maskable MetaQ Learning: Proposed a maskable MetaQ learning framework and demonstrated that gradient-based RL (MetaQ, PPO) fails to generate task abstraction, in contrast to human behavior and imitation learning agents.

CERTIFICATIONS

National Olympiad in Informatics in Provinces (NOIP)   **12 2017**
First Prize in Shandong Province

Undergraduate National Scholarship Honors   **12 2021**