Xinle Cheng

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Personal Profile

I am a second-year student majoring in Computer Science at Peking University. With my passion for software engineering, I have gained expertise in computer systems and networks, data structures and algorithms. I am particularly interested in machine learning and actively seeking opportunities in Machine Learning, Data Engineering, and Python Development fields.

Education

School Of Electronics Engineering And Computer Science, Peking University *Beijing,China*

Sophomore *Sept 2021 - now*

- Awarded the Academic Excellence Award in the 2021 academic year

High School Affiliated To Shanghai Jiao Tong University *Shanghai,China*

High School *Sept 2018 - June 2021*

- Graduated with Distinction
- Specialised in Physics, Chemistry, and Maths with Computer Science

GPA

Fall 2021	3.766
Spring 2022	3.884
Fall 2022	3.812

Research Experience

Stanford, PKU CoRe Lab *Beijing,China*

Technology Specialists *Mar 2023 - now*

- Collaborated with two Ph.D. students from Stanford University to jointly develop a framework for modeling and analyzing the relational features between successive frames of a video.
- First of all, we study whether an accurate dynamics model can be learned on top of rich frame-by-frame features produced by a self-supervised vision transformer.
- Second, we probe the learned dynamics model to see whether it has “discovered” vision tasks which typically require careful supervision: pixel tracking and object tracking.
- **Technical Skills:** proficiency in the Python programming language, along with a deep understanding of machine learning techniques, including transformers and diffusion-based methods.
- **Soft Skills:** Teamwork, Time Management, Communication, Presentation skills.

Peking University *Beijing,China*

Software Engineer *Feb 2023 - now*

- Collaborated with a four-person team to test the performance of various artificial intelligence (AI) algorithms, particularly those related to multi-agent and machine learning, in real-world scenarios.
- Currently, the limited computational power of small mobile robots hinders the deployment of many AI algorithms on these platforms, resulting in significant performance gaps compared to running on desktop computers. This indirectly limits many studies to simulated environments, or even simplified environments where robots are reduced to a point that can move freely without obstacles.
- To address this issue, we are building a small mobile robot platform based on Jetson Orin and a robot simulation platform based on Isaac Sim. We are testing various algorithms in both simulation and real-world environments, migrate existing algorithms to simulation environments, and validate their effectiveness in real-world scenarios.
- **Technical Skills:** C++, Python , Robot Operating System (ROS), a basic robotic skill Knowledge of task and motion planning, a fundamental robotic skill Experience using Isaac Sim, various AI algorithms, including multi-agent systems and machine learning.
- **Soft Skills:** Teamwork, Time Management, Communication, Presentation skills.

University Projects

Develop an interpreter for Lisp *Beijing, China*

Software Design *Feb 2023 - June 2023*

- The Mini-Lisp Interpreter is a project that aims to implement an interpreter for the Mini-Lisp language, which is a Lisp dialect closely resembling a subset of the R5RS specification.
- The goal of this project is to develop a fully functional interpreter that can parse and execute Mini-Lisp code. The interpreter will be responsible for handling various Lisp constructs such as function definitions, variable bindings, conditionals, and recursive calls. It will also support core Lisp features like lambda expressions, closures, and list manipulation operations.
- **Technical Skills:** C++, CMake, Git.
- **Soft Skills:** Time Management, Presentation skills, Report writing.

Write a Caching Web Proxy *Beijing, China*

Introduction to Computer Systems *Dec 2022*

- This project involves learning about basic HTTP operations and using sockets to write programs that communicate over network connections. The project is divided into three parts.
- In the initial stage, I familiarized myself with the fundamental operation of HTTP and learned how to use sockets to establish a network connection between client and server.
- For the next stage, I upgraded my proxy to handle multiple concurrent connections. This required me to gain an understanding of concurrency, which is a critical concept in systems programming.
- In the final stage, I implemented caching functionality for the proxy by developing a simple main memory cache for recently accessed web content.
- **Technical Skills:** C, CMake.
- **Soft Skills:** Time Management, Presentation skills, Report writing.

Image Captioning with Transformers *Beijing, China*

CS231n *Dec 2022*

- The goal of the project was to generate descriptive text captions for input images, using a Transformer decoder for sequence generation. To do this, I first preprocessed a large dataset of images and associated captions for training, validation, and testing.
- Next, I built a visual encoder based on a pre-trained model, which extracted high-level features from the input images. I then used these features, along with a learned word embedding, as input to the Transformer decoder, which generated a sequence of words to form the final caption. During training, I used cross-entropy loss to optimize the model's parameters.
- My system achieved state-of-the-art performance on several standard benchmarks for image captioning, demonstrating the effectiveness of the Transformer model for this task.
- **Technical Skills:** pytorch, latex.
- **Soft Skills:** Report writing, Logical Thinking, Critical Thinking.

Skills

Programming Python (Pandas, PyTorch, NumPy. etc.), ROS, C/C++.

Miscellaneous Linux, Shell (Bash/Zsh), LaTeX(Overleaf/R Markdown), Git.

Soft Skills Time Management, Teamwork, Problem-solving, Documentation, Engaging Presentation.

Achievements

2023 **324/340,** Graduate Record Examinations (GRE) *China*

2022 **Academic Excellence Award,** Peking University, 2021-2022 *China*

Interests

Tennis I have been playing tennis since high school, and now I am a member of the college tennis team.

Swimming I started swimming when I was 8.

Languages

English Professional proficiency, TOEFL 105/120

Chinese Native proficiency

References available upon request.