HAO LIU

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EDUCATION

Tsinghua University (THU) Sep 2020–present
Bachelor of Engineering (Computer Science and Technology)

- Computer Science Major GPA: 3.2 /4.0
- Core Courses: Fundamentals of Programming: 4.0
  Discrete Mathematics:3.6
  Linear Algebra: 3.6
  Foundation of Object-Oriented Programming: 4.0
  Artificial Neural Networks: 4.0
  Advances in Autonomous Driving and Intelligent Vehicles: 4.0 (A+)
  English Reading and Writing for academic purpose: 4.0 (A)
  English listening and speaking for academic purpose: 4.0 (A+)

Beijing Institute for General Artificial Intelligence (BIGAI) Sep 2022–present
Intern (Multiagent Group)

RESEARCH EXPERIENCE

Pairwise learning / Functional embedding
Advisor: Zhiting Hu / UCSD June 2022– September 2022

- Come up with a general framework to unify data & parameter space by learning pairs of data
- Experiment on different architectures like CNNs & Transformers and different areas like CV & NLP

Stock prediction based on large scale pretraining model February 2022–September 2022
Advisor: Maosong Sun / Tsinghua University

- Designed a complete finetuning pipeline based on Macro, Meso and Micro views of the stock market.
- Pretrained a transformer model on the large Chinese financial corpus using Pytorch.
- Wrote web crawlers to get more than 15G of Chinese financial text, built these data into a large pretrain corpus.

A Self-supervised pretraining model based on Encoder-Decoder-Unmasker architecture December 2021–February 2022
Advisor: None

- Developed a complete self-supervised model based on an Encoder-Decoder-Unmasker model training on ImageNet1K.
- Used the Encoder as the backbone net for image classification task and get competitive result. (Need further experiments)
- Explained the model intuitively using causal representation learning.
- Hand reproduced ViT and use it as the base architecture for my model.

A Q-A model based on query mechanism September 2021–November 2022
Advisor: Minlie Huang / Tsinghua University

- Built the Query mechanism in two different ways. One use traditional BM25 similarity algorithm, one pretrained on BERT to predict the correlation degree between a pair of Q-A.
- Query the corpus while pretraining on the LongLM (A pretrained transformer based model on Chinese corpus).
- Inferenced the model using test set and got better result than baseline. (Both BLEU and ROUGE score).
- Cleaned 1000K+ raw QA pairs from Zhihu and build the corpus.

Pollution Image classification system December 2017–October 2019(High school)
Advisor: Mingming Cheng / Nankai University

- Built a simple supervised learning classification model using SVM algorithm.
- Extracted features by hand using Dark channel algorithm, information entropy and Color Histogram in HSV color space.
- Wrote web crawlers to get more than 10K of different kinds pollution image.

COURSE EXPERIENCE

- Online course: Machine learning (Andrew Ng), URL:
  https://www.coursera.org/learn/machine-learning/home/welcome May 2018–October 2018(High school)
- Online course: Deep learning (Andrew Ng), URL:
  https://www.coursera.org/specializations/deep-learning May 2020–August 2020(High school)
- Open course: Stanford CS231n, Computer Vision (Feifei Li), URL:
  https://www.bilibili.com/video/BV1nJ411z7fe?spm_id_from=333.337.search-card.all.click September 2020–December 2020
- Open course: Stanford CS224n/Ling284, Natural language processing with deep learning (Chris Manning), URL:
  https://www.youtube.com/watch?v=rmVRLeJRkl4&list=PLoROMvodv4rOSH4v6133s9LFPRHjEmbmJ January 2022–February 2022
- Open course: Introduction to reinforcement learning (David Silver), URL:
  https://www.youtube.com/watch?v=2pWv7GOvuf0&list=PLqYmG7hTraZDM-OYHWgPebj2MfCFzFObQ May 2021– August 2021
- Open course: Stanford CS224w, Graph neural networks (Jure Leskovec), URL:
  https://www.youtube.com/watch?v=uEPPnR22fxg&list=PL-Y8zK4dwCrQyASidb2mjj_itW2-YYx6- May 2021– August 2021
- Open course: UCB CS285, Deep reinforcement learning (Sergey Levine), URL:
  https://www.youtube.com/watch?v=JHrlF10v2Og&list=PL_iWQOsE6TfURIIhCrlt-wj9ByIVpbfGc May 2021– August 2021
- Open course: Next Step of Machine Learning (Hongyi Lee), URL:
  https://www.youtube.com/watch?v=XnyM3-xtxHs&list=PLJV_el3uVTsOK_ZK5L0Iv_EQoL1JefRL4 January 2021– February 2021
- Open course: Geometric Deep Learning (Michael M. Bronstein), URL:
  https://geometricdeeplearning.com/lectures/ June 2022 – September2021

- Open course: Deep Multi-Task and Meta Learning (Chelsea Finn), URL: https://cs330.stanford.edu/ September2022 – present

ACADAMIC CONFERENCE/LECRTURE ATTENDENCE EXPERIENCE

China Theory Week 2018 | Tsinghua University | Guest high school student September 2018
- Topic: Theoretical computer science
- Hosted by Andrew Yao, lecture by Seth Pettie, Kasper Green Larsen etc.

World Intelligence Congress |Tianjin University | Guest high school student May 2019
- Topic: Conscious Turing Machine
- Lecture by Manuel Blum

2021 BAAI Conference|Beijing | Guest June 2021
- Topic: Artificial Intelligence
- Lecture by Yoshua Bengio

AWARDS

YINGCAIJIHUA (Research training for science and technology innovation for high school students) October 2019
- Outstanding paper award
- Outstanding Student award

"21st Century Cup" National English Speaking Competition October 2018
- Second award (Tianjin)

SKILLS

Language: Mandarin Chinese (First language), Fluent in English
Programming: C, C++, Python, HTML, Pytorch
Applications: Matlab, WordPress