Minghao (Spike) Fu

CONTACT

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RESEARCH INTEREST

Causal Discovery, Causal Representation Learning, AI for Science/Healthcare

EDUCATION

Mohamed bin Zayed University of Artificial Intelligence Abu Dhabi, UAE
M.S. in Machine Learning Aug 2023 - Present
Advisor: *Kun Zhang*

University of Electronic Science and Technology of China Chengdu, China
B.S. in Software Engineering, GPA: 3.78/4.00 (TOP 10%) Sep 2019 - June 2023
Graduated with Honor Research, Outstanding Undergraduate Thesis

RESEARCH EXPERIENCE

Mohamed bin Zayed University of Artificial Intelligence Abu Dhabi, UAE
Visiting Student & Research Assistant, *Department of Machine Learning*
Advisor: *Kun Zhang & Biwei Huang* May 2023 - Present

- **Causal Represenation Learning** on the climate data. Instead of recovering non-stationary latent variable, we hope to achieve a more general case: causal structure is dynamic with time changing.
- **Score-based Causal Discovery** with latent variables. Using likelihood-based search to estimate population causal relationship by samples distribution under faithfulness and graphical assumptions.
- **Trustworth AI for Healthcare** focuses on analyzing the baby crying audio to assist parents in understanding their baby's emotions. This project tackles challenges such as label noise and the novel category discovery.

Shanghai AI Lab Shanghai, China
Research Intern, *Ark NLP Group*
Advisor: *Jiangtao Feng & Fei Yuan* Nov 2022 - Mar 2023

- Focus on the **Non-Autoregressive** approach on long text generation. The goal is to simultaneously learn the semantic concept for parallel decoding.
- For machine translation, by using the kernel decomposition, it seeks to optimize the **Computational Complexity** from $O(n^2)$ to $O(n)$ while achieving a non-degraded performance.

University of Electronic Science and Technology of China, Chengdu, China
Research Assistant, *Center For Future Media*
Advisor: *Jie Shao* Apr 2022 - Aug 2022

- The research focuses on exploring **Efficient Inference** techniques in low-level vision representations. This involves learning structural reparameterization, kernel decomposition, and strategies for optimizing memory consumption.
- Explore **Meta Learning** algorithms to tackle the challenges of meta-overfitting. The goal is to develop approaches that generalize well in meta-learning scenarios.

SAP Chengdu, China
Cloud Developer Intern, *Department of Cloud Native* Jan 2022 - Mar 2022

PUBLICATIONS

Year 2022

Minghao Fu, Dongyang Zhang, Min Lei, Kun He, Changyu Li, Jie Shao. "Wide Feature Projection with Fast and Memory-Economic Attention for Efficient Image Super-Resolution". In *Birtish Machine Vision Conference* (BMVC), 2022

RESEARCH PROJECTS

Time-varying Causal Discovery On Climate Data MBZUAI & CMU
[Code] Aug 2023 - Present

Trustworthy AI for Healthcare: Letting Baby Talk to You MBZUAI & CMU
[Code] May 2023 - Nov 2023

Towards Lightweight and Efficient Image Super-Resolution UESTC
[Code] May 2022 - May 2023

NAT-L: Non-autoregressive Long Text Generation Shanghai AI Lab
[Code] Nov 2022 - Mar 2023

OPEN SOURCE PROJECTS

Microsoft News Recommendation and Intelligence MSRA (remote)
[Code] Jan 2022 - Mar 2022
Microsoft News Recommendation with Multi-Head Self-Attention (NRMS).

LMap: A Variant Associative Container by Red-Black Trees Sinux
[Code] Sep 2021 - Nov 2021
A modified associative container based on Red-Black Trees.

Object Distance Estimation Using a Monocular Camera UESTC
[Code] Jan 2021 - Aug 2021
Monocular distance estimation algorithm using affine transformation.

AWARDS AND HONORS

Outstanding Undergraduate Thesis Awards (Top 5%) Jun 2023

Honor Research Scholarship (Top 1%) Jun 2023

Champion **in The Human Phenotype Project Hackathon**, Weizmann Institute of Science & MBZUAI May 2023

Advanced Study Scholarship (Top 5%) May 2023

Undergraduate High-Level Paper Award (Top 1%) Apr 2023

UESTC Excellent Student Scholarship (Top 10%) Sep 2022

First Prize **in China College Students Innovation and Entrepreneurship Competition** (Top 1%) Jun 2021

TALKS AND PRESENTATIONS

Year 2022

BMVC 2022: "Wide Feature Projection with Fast and Memory-Economic Attention for Efficient Image Super-Resolution", London, UK Nov 2022

Undergraduate Student Research Session: "Towards Building Efficient AI Model",

Chengdu, China Sep 2022