Minghao (Spike) Fu

CONTACT

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RESEARCH INTEREST

Causal Discovery, Causal Representation Learning, Causal Structural Learning
Causality-inspired ML on Real-World Problems (Climate/Healthcare)

EDUCATION

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

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

RESEARCH EXPERIENCE

University of California, San Diego, California, USA
Visiting Student, Causality-UCSD Nov 2023 - Present
- Advisor: Biwei Huang

Mohamed bin Zayed University of Artificial Intelligence, Abu Dhabi, UAE
Research Assistant, Causality Group May 2023 - Aug 2023
- Advisor: Kun Zhang

Shanghai Artificial Intelligence Laboratory, Shanghai, China
Research Intern, Ark NLP Group Nov 2022 - Mar 2023

University of Electronic Science and Technology of China, Chengdu, China
Research Assistant, Center For Future Media Apr 2022 - Aug 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

Causal Discovery and Representation Learning on Climate Temperature
MBZUAI & CMU & UCSD Sep 2023 - Present
- **Causal Representation Learning**. Instead of learning non-stationary latent variables, we hope to achieve a more general case: allow time-varying causal relationship within observed variables.
- **Score-based Causal Discovery** with latent variables. Using likelihood-based search to estimate population causal relationship by samples distribution under faithfulness and graphical assumptions.

Trustworthy AI for Healthcare: Letting Baby Talk to You
MBZUAI & CMU May 2023 - Nov 2023
- **Trustworth ML for Healthcare** focuses on analyzing the baby crying audio to assist parents in understanding their baby's emotions. This project tackles challenges including label noise, data imbalance, and novel category discovery.

NAT-L: Non-autoregressive Long Text Generation
Shanghai Artificial Intelligence Laboratory 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.
- Seeks to optimize the **Computational Complexity** from $O(n^2)$ to $O(n)$ in machine translation while achieving a non-degraded performance.

Towards Lightweight and Efficient Image Super-Resolution
UESTC May 2023 - Nov 2023

- Exploring **Efficient Inference** techniques in low-level vision tasks, which involves learning structural reparameterization, kernel decomposition, and strategies for optimizing memory consumption.

OPEN SOURCE PROJECTS

Microsoft News Recommendation and Intelligence
Microsoft Research Asia (remote) Jan 2022 - Mar 2022

LMap: A Variant Associative Container by Red-Black Trees
Sinux Sep 2021 - Nov 2021

Object Distance Estimation Using a Monocular Camera
UESTC Jan 2021 - Aug 2021

AWARDS AND HONORS

Outstanding Undergraduate Thesis Awards, *5%* Jun 2023

Honor Research Scholarship, *1%* Jun 2023

Championship in The Human Phenotype Project Hackathon
Weizmann Institute of Science & MBZUAI May 2023

Advanced Study Scholarship, *5%* May 2023

Undergraduate High-Level Paper Award, *1%* Apr 2023

UESTC Excellent Student Scholarship, *10%* Sep 2022

First Prize in China College Students Innovation and Entrepreneurship Competition, *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