Fangfu Liu

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EDUCATION

Department of Electronic Engineering, Tsinghua University, Beijing, China *Aug 2019 - Present*
Overall GPA: 3.89/4.0 **Ranking:** top 10% in 280+ students
Among the **55** required courses I have taken so far, **48** have received a grade of **4.0**, with most of them being fundamental courses in mathematics and core courses in electronic engineering.
Advisor: Yueqi Duan

PUBLICATIONS

CausalForensics: Deepfake Detection with Contrastive Causal Learning.
Haixu Song, Fangfu Liu, Xiaoke Yang, Jiwen Lu, Jie Zhou, Yueqi Duan.
Submitted.

Discovering Dynamic Causal Space for DAG Structure Learning. [PDF]
Fangfu Liu, Wenchang Ma, An Zhang, Xiang Wang, Yueqi Duan, Tat-Seng Chua.
Accepted to KDD 2023.

Semantic Ray: Learning a Generalizable Semantic Field with Cross-Reprojection Attention. [PDF]
Fangfu Liu, Chubin Zhang, Yu Zheng, Yueqi Duan.
Accepted to CVPR 2023.

Boosting Differentiable Causal Discovery via Adaptive Sample Reweighting. [PDF]
An Zhang, Fangfu Liu, Wenchang Ma, Zhibo Cai, Xiang Wang, Tat-Seng Chua.
Accepted to ICLR 2023.

RESEARCH EXPERIENCE

Topic: Generalizable Semantic NeRF *Aug 2022 - Dec 2022*
Instructor: Prof. Yueqi Duan, Tsinghua University
Goal: Aim to learn a semantic radiance field from multiple scenes that is accurate, efficient, and generalizable.

- We propose a neural semantic representation called Semantic-Ray to build a generalizable semantic field, which is able to learn from multiple scenes and directly infer semantics on novel viewpoints across novel scenes. We also design a cross-reprojection module to fully exploit semantic information from multiple reprojections of rays.

- Extensive experiments on both synthetic and real-world datasets demonstrate the strong generalizability of our S-Ray and the effectiveness of our cross-reprojection attention design.

Topic: Differentiable Causal Discovery *June 2022 - Sept 2022*
Instructor: Prof. Tat-Seng Chua, Dr. An Zhang; NexT++, NUS
Goal: Learn causal structure from purely observational data by differentiable score-based optimization.

- We propose ReScore, a simple-yet-effective model-agnostic optimization framework that simultaneously eliminates spurious edge learning and generalizes to heterogeneous data by utilizing learnable adaptive weights.

- We discover a novel optimization scheme for DAG structure learning called CASPER that encodes the graph structure of the structural equation model in a dynamic causal space.

COMPETITION EXPERIENCES

Tsinghua University Innosilicon Program – Smart Car Challenge *Jan 2020 - Feb 2020*

- As the team leader, responsible for planning the entire competition program.

- Responsible for software development, such as automatic tracking, ultrasonic obstacle avoidance, etc.

- Rank 6 out of 50+ teams.

Tsinghua University Hardware Design Competition   *Aug 2020 - Nov 2020*

- Gesture-based quadcopter drone, which entered the Science and Technology Exhibition of Tsinghua University.

- Responsible for software, development of Arduino gesture control system and UAV hardware debugging.

- Rank 3 out of 80+ teams.

The 40th Challenge Cup of Tsinghua University   *Dec 2021 - Apr 2022*

- In the topic of Task-Oriented Interactive Robot-System with Cross-Modal Collaboration, responsible for trajectory planning of the robot arm and design of the visual system. **Awarded the Third Prize.**

- In another topic of High-Efficiency Bidirectional Frequency Regulation Interactive Exchange Cabinet for Smart Grids, responsible for circuit design of the charging time for bidirectional charging. **Awarded the First Prize.**

SCHOLARSHIP AND HORNORS

1. **National Scholarship (Top 1 in 260+ in the 2019-2020 academic year)**   *2020.10*
2. **Tsinghua University Comprehensive Excellent Award (Top 5% in 260+) twice**   *2020.10, 2021.10*
3. Tsinghua Science and Technology Innovation Excellence Award   *2022.10*
4. Four star Bauhinia volunteer of Tsinghua University (Volunteer hours up to **150h**)   *2021.5*
5. Advanced individual award of Tsinghua University   *2019.10*
6. Tsinghua University Freshman Basketball Championship   *2019.10*
7. Excellent Admissions Backbone of Tsinghua University   *2021.11*
8. 100m champion of Tsinghua University Sports Games   *2020.3*

LEADERSHIP

1. Counselor of Summer School of Tsinghua University   *Jul 2021 - Aug 2021*
2. Backbone of Tsinghua University Q&A Workshop   *May 2020 - Present*
3. Director of Practice Department of Tsinghua University Colledge   *May 2021 - Present*
4. Organizer of the main venue of the 110th anniversary celebration of Tsinghua University *Apr 2021 - May 2021*
5. Captin of the winter and summer vacation practice detachment three times   *Jan 2020, Aug 202, Jan 2021*
6. Captin of class basketball team and the main force of basketball team in EE department *Sept 2019 - Sept 2021*

SKILLS

Sepcialty: **Go** 5d   **Erhu** level 10