

# FENGRUI TIAN

Master's Student, School of Artificial Intelligence, Xi'an Jiaotong University

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## EDUCATION

**School of Artificial Intelligence, Xi'an Jiaotong University**

2021 - 2024

M.Eng., Control Science and Engineering

Supervisor: Prof. [Shaoyi Du](#)

GPA: 3.73/4.0 (90.85/100); **General ranking: 1/107**

**School of Software Engineering, Xi'an Jiaotong University**

2017 - 2021

B.Eng., Software Engineering

Supervisor: Prof. [Zhiqiang Tian](#)

GPA: 3.56/4.3 (85.96/100)

## EXPERIENCES

**Tsinghua University, Shanghai AI Laboratory and SenseTime Group Ltd.**

Mar. 2022 - Present

Research Intern, Advisor: Prof. [Yueqi Duan](#)

*Beijing, China*

- Studied the generalization ability of dynamic radiance fields and semantic reconstruction of dynamic scenes.
- Proposed a generalizable dynamic radiance field from monocular videos termed **MonoNeRF** [3], which supports several new applications such as training from multiple scenes, novel view synthesis from unseen frames, fast novel scene adaption and scene editing.
- Proposed a semantic field of dynamic scenes dubbed **Semantic Flow** [2] that learns from flows for capturing motion information and supports new applications such as instance-level scene editing, semantic completion, dynamic scene tracking and semantic adaption on novel scenes.

**Johns Hopkins University**

Jun. 2023 - Present

Research Intern, Advisor: [Angtian Wang](#), Prof. [Alan L. Yuille](#)

*Baltimore, USA*

- Focused on learning an object pose estimator without pose estimation, which is following the philosophy of Analysis by Synthesis.
- Currently working on building the instance-level feature bank from different views of an instance by leveraging the power of diffusion models.

**Megvii Research**

Apr. 2021 - Jan. 2022

Research Intern

*Beijing, China*

- Dedicated to fine-grained video representation with self-supervised learning.
- Proposed a video representation learning network called **TCVM** [4] based on feature differences. It directly captures motion information by frame feature difference.
- Won the Outstanding Intern Award (the only one in the group).

**Xi'an Jiaotong University**

Apr. 2020 - Oct. 2021

Research Assistant, Supervisor: Prof. [Zhiqiang Tian](#)

*Xi'an, China*

- Dedicated to apply deep learning technology to assisting medical diagnosis by introducing the interaction experiences of radiologists into AI models.
- Proposed an interactive segmentation method named **Surface-GCN** [5] that learns radiologist interaction experiences from imitations.

**National University of Singapore**

Jul. 2019

Team Leader

*Singapore*

- Organized other three team members to detect potential connections between movies and books with data on Douban website by data mining algorithms.

- Analyzed the relationship among 105 user groups, 8 different types of books and 117 movies and established the **Books2Movies** [8] recommendation system based on the relationship.

## PUBLICATIONS & MANUSCRIPTS

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# Equal contribution, (✉) Corresponding author

- [1] **Fengrui Tian**, Yaoyao Liu, Alan Yuille, Adam Kortylewski, Yueqi Duan, Shaoyi Du, Angtian Wang<sup>(✉)</sup>, Learning a Category-level Object Pose Estimator without Pose Annotations, *Under review*, 2024.
- [2] **Fengrui Tian**, Yueqi Duan, Angtian Wang, Jianfei Guo, Shaoyi Du<sup>(✉)</sup>, Semantic Flow: Learning Semantic Fields of Dynamic Scenes from Monocular Videos, *International Conference on Learning Representations (ICLR)*, 2024.
- [3] **Fengrui Tian**, Shaoyi Du, Yueqi Duan<sup>(✉)</sup>, MonoNeRF: Learning a Generalizable Dynamic Radiance Field from Monocular Videos, *International Conference on Computer Vision (ICCV)*, 2023. (**Representative work**) [PDF] [Github] [Youtube Video]
- [4] **Fengrui Tian**<sup>#</sup>, Jiawei Fan<sup>#</sup>, Xie Yu, Shaoyi Du<sup>(✉)</sup>, Meina Song, and Yu Zhao, TCVM: Temporal Contrasting Video Montage Framework for Self-supervised Video Representation Learning, *Asian Conference on Computer Vision (ACCV)*, pp. 1539-1555. 2022. (Oral, **Best Paper Award Honorable Mention**) [PDF]
- [5] **Fengrui Tian**, Zhiqiang Tian<sup>(✉)</sup>, Zhang Chen, Dong Zhang, Shaoyi Du<sup>(✉)</sup>, Surface-GCN: Learning Interaction Experience for Organ Segmentation in 3D Medical Images, *Medical Physics* (IF: 4.071), 2023. [PDF]
- [6] Yuying Liu, Shaoyi Du<sup>(✉)</sup>, Shengwei Zhao, **Fengrui Tian**, Wei Zeng, Zhiqiang Tian, Text-guided Semantic Structure Alignment for Domain Adaptation, *Under review*, 2023.
- [7] Chenhong Tian, **Fengrui Tian**, Xiaozhi Du<sup>(✉)</sup>, Checkpoint Optimization Approach with Application Multiple-state for Real-time Embedded System, *Technical Report*, 2020.

## PROJECTS

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- [8] **Books2Movies**. Analyzed the relationship between 105 user groups and 8 different types of books and the relationship between 117 movies and different groups of users and then established the connection "books-users-movies" based on those 2 relationships. This work was done when **Fengrui Tian** attended the summer program at National University of Singapore. (Try it here: <https://tianfr.github.io/Books2Movies/>)

## AWARDS

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- **ACCV Best Paper Award Honorable Mention (2/278)** 2022
- **Top 15 Postgraduate Students Honorable Mention (Top 0.1%)**, Xi'an Jiaotong University 2023
- **National Scholarship** (Highest scholarship awarded by the Chinese government, **Top 0.1%**) 2023
- **Xiaomi Special Scholarship** (Highest scholarship sponsored by Xiaomi Corp., **Top 0.1%**) 2023
- **Special Scholarship (Top 10%)**, Xi'an Jiaotong University 2022
- **Outstanding Undergraduate Thesis** (Highest honor for undergraduate thesis, **Top 1%**) 2021

## INVITED TALKS

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- MonoNeRF: Learning a Generalizable Dynamic Radiance Field from Monocular Videos [Slides] Sep. 2023  
*Talk at CCVL group, Johns Hopkins University*
- MonoNeRF and Semantic Flow Apr. 2023  
*Talk at Image Registration and Machine Learning (IRML) group, Xi'an Jiaotong University*
- MonoNeRF and Beyond Dec. 2022  
*Talk at the Department of Electronic Engineering, Tsinghua University*

## ACADEMIC SERVICE

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| • CVPR 2024  | Reviewer          |
| • IEEE Transactions on Graphic                                   | Assisted reviewer |
| • IEEE Transactions on Circuits and Systems for Video Technology | Assisted reviewer |

## SKILLS AND OTHERS

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MMCV issue #2309, bug P1 report: <https://github.com/open-mmlab/mmcv/issues/2309>

Language: Chinese (native), English (TOEFL 98, Best Score 100; CET-6 546)

Sports: Badminton, Swimming