Zeen (Harry) Chi

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Education

- **ShanghaiTech University** — Shanghai, China
  B.Eng. Candidate, Computer Science — *Sept. 2020 - Present*
  - Overall GPA: **3.97/4.0** (rank **1/248** in school)
  - Major GPA: **4.0/4.0**
  - Selected Coursework: Introduction to Machine Learning (A+), Computer Graphics (A+), Artificial Intelligence (A+), Computer Architecture (A+), Mathematical Analysis (A+), Probability and Statistics (A+), Discrete Mathematics (A+)
- **Massachusetts Institute of Technology (MIT)** — Cambridge, MA
  Undergraduate Exchange Student, Computer Science — *Feb. 2023 - May 2023*
  - GPA: **5.0/5.0**
  - Coursework: Advances in Computer Vision (A), Matrix Methods (A)

Research Interests

I am interested in **Computer Vision** and **Applied Machine Learning in Biomedical Image Analysis**, especially the segmentation and registration of MRI, CT, and X-ray. My current research focuses on learning biomedical image atlases with neural fields.

Publications

- **Dynamic Neural Fields for Learning Atlases of 4D Fetal MRI Time-series**
  Zeen Chi*, *Zhongxiao Cong**, *Clinton Wang, Yingcheng Liu, P. Ellen Grant, E. Abaci Turk, S. Mazdak Abulnaga, Neel Dey, Polina Golland (* indicates equal contribution)*
  In review of MedNeurIPS Workshop @ NeurIPS 2023

Research Experience

- **MIT CSAIL, Medical Vision Group** — Cambridge, MA
  Research Assistant, advised by Prof. Polina Golland and Dr. Neel Dey — *Mar. 2023 - Aug. 2023*
  - **Dynamic Neural Fields for Learning Atlases of 4D Fetal MRI Time-series**
    - Proposed to frame subject-specific atlas building as learning a neural field of deformable spatiotemporal observations
    - Applied the proposed method to learning subject-specific atlases and motion stabilization of dynamic BOLD MRI time-series of fetuses *in utero*
    - Yielded high-quality atlases with competitive registration performance and ∼5-7× faster convergence compared to existing work
- **ShanghaiTech Visual & Data Intelligence Center, PLUS Lab** — Shanghai, China
  Research Assistant, advised by Prof. Xuming He — *Aug. 2022 - Dec. 2022*
  - **Long-tailed Recognition in Human-Object Interaction Detection**
    - Introduced the overall information of human posture as a prior cue to improve the HOI detection confidence level for the corresponding possible categories
    - Investigated long-tailed distribution in HOI datasets, and assessed multiple established mainstream methods for mitigating this issue

Course Projects

- **Adversarial Attacks and Defense in Image Classification [code]** — Cambridge, MA
  MIT 18.0651: Matrix Methods in Data Analysis, Signal Processing, and Machine Learning — *Apr. 2023 - May 2023*
  - Thoroughly reviewed the development of adversarial attack and defense in image classification
  - Implemented representative adversarial attack and defense algorithms, and conducted extensive experiments on the ImageNet dataset to evaluate and compare their performances and robustness.
- **Ray Tracing NURBS Surfaces [code]** — Shanghai, China
  ShanghaiTech CS171: Computer Graphics I — *Dec. 2022 - Jan. 2023*
  - Implemented a path tracer with global illumination for directly rendering untrimmed NURBS surfaces without tessellation; created more than 3300 C++ baseline
  - Applied surface refinement for better rendering quality and efficiency
  - Constructed a BVH to maintain the surface sub-patches and accelerate the ray-patch intersection process
- **AI-Agent Chinese Chess [code]** — Shanghai, China
  ShanghaiTech CS181: Artificial Intelligence — *Nov. 2022 - Jan. 2023*
  - Created a multi-functional Chinese Chess game with multiple AI agents with Python and C++
  - Built the game panel for human players, with Pygame for Python and JUCE for C++, respectively
  - Implemented three AI agents, including Minimax Search, Q-Learning, and Monte-Carlo Tree Search

- **Who is Flying over?** [code][demo] Shanghai, China
  ShanghaiTech SI100B: Intro to Information Science and Technology *Dec. 2020 - Jan. 2021*
  - Built a website from scratch on Raspberry Pi that displays real-time information about regional flights
  - Utilized web crawler for data fetching and simultaneously displayed the data via LED and website
  - Implemented a feature-rich control panel on the website for real-time human-computer interactions, including region selection and LED control
  - Won the Excellent Course Project Award **(Top 1)** [poster]

Honors and Awards

- ShanghaiTech International Exchange Program **Scholarship**, ∼$12,000 June 2023
- ShanghaiTech **Outstanding Student** (Ranked in the **top 2%** of the school) Jan. 2022
- ShanghaiTech **Outstanding Student** (Ranked in the **top 3%-7%** of the school) Dec. 2022
- The **Outstanding Individual** of ShanghaiTech Career Trek Program Nov. 2022
- The **Outstanding Individual** of ShanghaiTech Social Research Program in Chinese Poor Areas Nov. 2021
- **First Prize**, the 2018 National Olympiad in Informatics in Provinces, Shandong Dec. 2018

Skills

- **Languages:** Python, C, C++, MATLAB
- **Tools:** PyTorch, OpenGL, Git, ITK-SNAP

Volunteer Experience

- **Shanghai Marathon 2022** Shanghai, China
  Assisted athletes in check-in *Nov. 2022*
- **RISC-V World Conference China 2021** Shanghai, China
  Assisted the organizer to set up the venue and provided technical support to the participants *June 2021*
- **Undergraduate Admissions Presentation** Qingdao, China
  Lectured on ShanghaiTech University to high school students in Qingdao *Jan. 2021 & June 2022*
- **COVID-19 Campus Voluntary Service** Shanghai, China
  Assisted in COVID test and distributing supplies during the lockdown of Shanghai *Apr. 2022 - May 2022*

Language

- **Chinese:** Native
- **English:** Fluent
  - TOEFL: 105 with R28/L26/S22/W29
  - GRE: 330 + 4.0 with V160/Q170