TIANAO LI

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📍 Tsinghua University, Beijing, P.R.China

EDUCATION

Tsinghua University, Beijing, P.R.China   *Sept. 2019 - Jun. 2023*
B.E. in Electronic Engineering
Curricular Certificate Program in Astronomy
GPA: 3.84/4.0 (overall)
Relevant Coursework: Digital Image Processing (A-), Introduction to Fourier Optics (A), Probability and Stochastic Processes (A), Introduction to Auditory-Visual Information System (A-), Advanced Matlab Programming (A+), Data and Algorithm (A-), Signals and Systems (A-), Digital Signal Processing (A-), Linear Algebra(A-)
Beijing No.4 High School, Beijing, P.R.China   *Sept. 2016 - Jun. 2019*

HONORS & AWARDS

- Tsinghua University Scholarship of Comprehensive Excellence (top 10%, 2021)
- National College Students' Physics Competition: First Award (2020)
- Tsinghua University Scholarship of Social Work (2020)
- Tsinghua Hardware Design Competition: Third Award (2020)

RESEARCH INTERESTS

My research interest lies at the intersection of computational imaging, computer vision, signal processing, optimization, and machine learning. I'm especially interested in inverse problems, physics-informed deep learning in imaging, and astronomical imaging. I'm also open to bio-inspired vision, HDR imaging, biomedical imaging, and Nerf.

RESEARCH EXPERIENCE

Northwestern University, Evaston, IL, USA   *Apr. 2022 - Oct. 2022*
Bio-Inspired Vision Lab
Research Intern (Remote), Advisor: **Prof. Emma Alexander**
• Applied algorithm unrolling to the PSF deconvolution problem in galaxy images, significantly reducing systematic error in weak gravitational lensing shear measurements. Adopted a more appropriate Poisson noise model and used a neural network to learn the priors with Plug-and-Play ADMM.
• Method outperforms previous algorithms in shape error of recovered galaxies.
• Paper submitted to Monthly Notices of the Royal Astronomy Society (MNRAS), currently under review.

Tsinghua University, Beijing, P.R. China   *Sept. 2021 - Feb. 2022*
Tsinghua Visual Intelligence and Computational Imaging Lab
Research Assistant, Advisor: **Prof. Lu Fang**
• Collaborated with a Ph.D. student on an Diffractive Neural Network (DNN) implemention of Nerf.
• Implemented a Point Cloud classification network with DNN.

SKILLS

- **Coding:**   Python, PyTorch, TensorFlow, Matlab, C/C++, Git, LaTeX
- **Language:**   English (TOEFL:111, S:26), Mandarin (Native)

SELECTED PROJECTS

Fire Detection [Github]   Jun. 2022
- A Python implemention of a non-deep learning fire detection pipeline.
- Pipeline comprises of three parts: color space classifier, color component classifier and texture classifier.
- Trained and tested on the BoWFire Dataset and is able to detect fire from static images with an accuracy of 80

Video-Audio Signal Processing [Github]   Dec. 2021
- Developed joint video-audio processing algorithms in Python.
- Recognizing faces from videos clips, recongizing voices from audios and separating the speeches from videos with given visual and audio information of the speakers.

Video Editing Based on Rhythm Matching [Github] [Video]   Jul. 2021
- Developed a video-editing algorithm in Matlab.
- Capable of creating a video from a given set of video clips and a piece of background music to best match the clips' audio rhythm with the background music.

EXTRA-CURRICULARS

- **Vice president of Tsinghua Astronomy Society (2021-22).**
- Head of school observatory (2021-22).
- Organized astronomical popularization summer camp for junior high students in Guizhou and Xizang, China in 2021.
- Volunteer at Tsinghua Q&A Workshop with a total service hour of 147.5h.