YU YUAN

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EDUCATION BACKGROUND

Shanghai Jiao Tong University — Shanghai, China
MSc in Aeronautical and Astronautical Science and Technology; GPA: 3.62/4.0 — *09/2020 – 06/2023*

Shanghai Jiao Tong University — Shanghai, China
Bachelor of Aerospace Engineering; GPA: 83.14/100; Ranking: 9/29 — *09/2016 – 06/2020*
Minor Degree in Administration Management — *10/2018 – 06/2020*

PUBLICATIONS

Yu Yuan, Jiaqi Wu, Lindong Wang, Zhongliang Jing, Henry Leung, Shuyuan Zhu, Han Pan. *Learning to Kindle the Starlight*. The IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 2023 [Under review] | *arXiv*

- Constructed the first star field image enhancement benchmark consisting of 355 real-shot and 854 semi-synthetic image pairs, which makes the comparisons of different deep methods on the star field images possible.
- Proposed the first star field image enhancement approach, namely StarDiffusion, based on conditional denoising diffusion probabilistic models (DDPM). StarDiffusion outperformed state-of-the-art low-light image enhancement algorithms on low-light image enhancement and star field image enhancement tasks.
- Performed dynamic stochastic corruptions on the inputs of conditional DDPM to improve the learning capability and generalization performance of the network on small-scale datasets.

Yu Yuan, Jiaqi Wu, Zhongliang Jing, Henry Leung, Han Pan. *Ghost-free High Dynamic Range Imaging via Dual-input Hybrid CNN-Transformer and Structure Tensor*. IEEE Signal Processing Letters (SPL) [In revision] | *arXiv*

- Developed a hybrid CNN-Transformer network to process dual-input LDR images for HDR deghosting. The network was capable of processing an arbitrary number of input LDR images for the first time.
- Aggregated the structural tensor information of LDR images into the network and introduce the structural tensor loss to further constrain the ghosting artifacts.

Yu Yuan, Jiaqi Wu, Zhongliang Jing, Henry Leung, Han Pan. *Multimodal Image Fusion based on Hybrid CNN-Transformer and Non-local Cross-modal Attention*. 2023 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP). [Under review] | *arXiv*

- Presented a model consisting of a convolutional encoder and a Transformer-based decoder to fuse multimodal images.
- Designed a non-local cross-modal attention mechanism to capture both local and global dependencies by calculating associations between features at any two locations.

Yu Yuan, Han Pan, Shuqing Cao, Zhongliang Jing. *Joint Image Pansharpening and Registration via Structure Tensor Total Variation Regularization*. Aerospace System. [Published] | *Springer*

- Proposed a framework for joint pansharpening and registration with structure tensor total variation regularization.
- Developed a minimization algorithm based on the scheme of fast iterative shrinkage-thresholding algorithm (FISTA).

PROJECTS

A Underwater Binocular Multi-exposure Imaging System

- Constructed a high-resolution underwater binocular imaging system with hardware synchronization, which can independently control the exposure parameters of both cameras.
- Generated the first underwater binocular multi-exposure dataset. Realized spatial alignment and fusion of images captured by the binocular imaging system.

Ultra-wideband-based Cooperative Multi-UAV Positioning Technology

- Built a real-time and high-precision multi-UAV cooperative positioning system based on UWB.

A Modular Custom Aviation Model Design for Tyros

- Developed two simple and highly robust aviation models based on modeling ideas.
- Constructed an aviation model assembly simulation platform based on Unity 3D and Kerbal Space Program.

Patent

A trajectory solving and alignment method based on inertial guidance and ultra-short baseline positioning sensors for autonomous underwater robots. CN202210548232.5

International Practical Experience

Addis Ababa University Addis Ababa, Ethiopia
Global Challenge Project *01/2020 – 01/2020*

- Conducted field research on the use of herbal medicines in Ethiopia, participated in the construction of the African Herbal Pharmacopoeia database, and provided online data storage, query and analysis support for the research and development of local special herbs and standards in Africa.
- Documented the work process of the project and produced the corresponding documentary.

Columbia University New York, United States
Columbia Young Development Program *07/2018 – 08/2018*

- Attended the summer school of Columbia University, and took elective courses in data and analysis. Completed all courses with excellent ratings.

Awards & Competitions

Ivy League Scholarship for Exceptional Students (Innovation)	Top 1%
China Space Foundation: Guoqiang Aerospace Scholarship	Top 5%
National Encouragement Scholarship	Top 5%
Outstanding Graduate of Shanghai Jiao Tong University	Top 15%
Shanghai International Creators Competition: Special Competition of Drones	First Prize
DELL AI for Social Innovation Competition: AI/ADAS of Intelligent Cart	National Second Prize

Skills

Languages: IELTS 7.0, GRE 158+169+3.5, Chinese (Native)
Programming: Python, PyTorch, MATLAB, C/C++(basic)
Technologies: Git, LaTex, Simulink, Adobe PS, Adobe PR, Linux, Raspberry Pi, NVIDIA Jetson
Interests: Photography, Drones, Swimming, Cycling, Hiking, Rowing

Other Activities

Teaching Assistant: AV308 Automatic Control Theory
Review Service: IEEE ICASSP 2023
IEEE Graduate Student Member