Fei Zhang

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Location: Lynnfield, MA 01940 585-445-0302

OBJECTIVE

Researcher with a Ph.D. in Imaging Science and extensive experience in sensor data processing, LiDAR point clouds, hyperspectral imaging, and machine learning applications. Eager to contribute to innovative research projects in data-driven sensing and image processing, with a focus on developing advanced solutions for real-world challenges in environmental, geospatial, and autonomous systems.

EDUCATION

Rochester Institute of Technology (RIT), NY, USA

Ph.D. in Imaging Science 09/2018 – 12/2022

- **Research Focus**: Drone-based remote sensing, 3D point cloud processing, multispectral image processing, Structure-from-Motion, sensor data fusion.
- **Research Projects**:
  - Designed drone flight paths based on analysis of characteristics of multiple sensors.
  - Preprocessed and analyzed high-throughput LiDAR and multispectral imagery data.
  - Registered LiDAR point cloud with Structure-from-Motion point cloud.
  - Researched on yield prediction and disease detection in crops using classical and machine learning algorithms on multi-sensor data.

Zhejiang University (ZJU), Hangzhou, China

M.S. in Optical Engineering 09/2015 – 03/2018

Wuhan University (WHU), Wuhan, China

B.E. in Optical Information Science and Technology 09/2011 – 06/2015

SKILLS

Programming: Python

Language: Chinese (Native Speaker).

Tools/Libraries: Git, Linux, Jira, Confluence; Pytorch, scikit-learn, OpenCV.

WORK EXPERIENCE

Rochester Institute of Technology, Rochester, NY

Postdoctoral Researcher 09/2023 – present

- Developed machine learning based methodologies for LiDAR point cloud registration, semantic segmentation, and detailed analysis of tree structures and complex root systems, towards carbon credit accounting.
- Contributed to open-source hyperspectral imaging projects, enhancing accessibility and functionality for researchers and developers in the remote sensing community.

Motional, Inc., Boston, MA

Camera ISP Engineer 09/2022 – 06/2024

- **Perception Stack Development**: Evaluated multiple neural network perception models using large-scale LiDAR, camera, and sensor fusion datasets. Analysis reports contributed directly to designing sensor solutions for next-generation autonomous vehicles.
- **Image Processing and Analysis**: Deployed and fine-tuned a proprietary Image Signal Processing (ISP) pipeline using Python, enabling in-house raw imagery data processing. Led the development, verification, and implementation of the pipeline, ensuring robust performance and seamless integration across cross-functional teams.

- **Algorithm Development**: Developed a heuristic algorithm to detect and evaluate vehicle headlight flare in nighttime images, significantly reducing manual inspection time by hundreds of hours.
- **Image Data Acquisition:** Brought up a RTOS and Linux based camera development-kit board. Conducted hardware simulation for tuning on-board ISP parameters.
- **Camera Lab Tests:** Characterized multiple cameras using Imatest and ImageEnigneering devices to evaluated and validated image quality. Conducted Gage R&R analysis for multiple camera models. Automated image acquisition for raw data collection using python and bash script.

Hangzhou ToupTek Photonics Co., Ltd., Hangzhou, China
Embedded Camera System Engineer 09/2015 – 11/2017

- **Camera Systems Development**: Engineered over ten types of product-level CMOS cameras based on FPGA, conducted PCB design, hardware testing, debugging, and sensor data transmission.
- **Sensor Configuration**: Configured a variety of imaging sensors from Sony and Teledyne using Verilog and C++, such as IMX250, IMX252, IMX274, IMX304, IMX385, etc.
- **Performance Testing**: Executed rigorous testing protocols with tools such as oscilloscopes, multimeters to maintain high standards of camera performance, resolving firmware and hardware issues efficiently.
- **Automation Framework**: Collaborated with software developers to enhance the test automation framework, improving testing efficiency and accuracy.

OmniVision Technologies, Inc., Santa Clara, CA
Research Intern - Color Imaging 09/2021 – 01/2022

- Applied and tuned novel deep learning algorithms to under-display-camera images for glare removal, proving and disproving potential algorithms for eliminating glare in images.
- Detected strong glare and recognized its pattern in images using morphological and clustering algorithms.

Motorola Mobility, LLC., Chicago, IL
Research Intern 06/2021 – 08/2021

- Generated a dataset of hundreds of images using GAN to evaluate objective image quality assessment (IQA) metrics. Tested and compared 10+ full-reference and non-reference IQA metrics on the dataset.
- Developed a comprehensive new metric that outperformed traditional metrics such as PSNR and SSIM by over 10% in accuracy.

SELECTED PUBLICATIONS

- Zhang, Fei, et al. "Enhancing snap bean yield prediction through synergistic integration of UAS-Based LiDAR and multispectral imagery." Computers and Electronics in Agriculture 230 (2025): 109923.
- Zhang, Fei, et al. "Comparison of UAS-based structure-from-motion and LiDAR for structural characterization of short broadacre crops." Remote Sensing 13.19 (2021): 3975.
- Zhang, Fei, et al. "Evaluation of Leaf Area Index (LAI) of Broadacre crops using UAS-Based LiDAR point clouds and multispectral imagery." IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing 15 (2022): 4027-4044.
- Zhang, Fei, et al. "Toward a structural description of row crops using UAS-based LiDAR point clouds." IGARSS 2020-2020 IEEE International Geoscience and Remote Sensing Symposium. IEEE, 2020.