

Yu SHEN

lastseed@live.cn

<http://www.cs.umd.edu/~yushen/>

+1(650)2554616

EDUCATION

University of Maryland *Doctor of Philosophy; Computer Science Major* 08/2020-08/2023(Expected)

University of Maryland *Master of Science; Computer Science Major* 08/2018-05/2020

- Related Courses: Deep learning, Visual Learning and Recognition, High Performance Computing Systems, AI Planning, Advanced Computer Graphics, Robotics, Advanced Linear Numerical Analysis, etc.

East China Normal University *Bachelor of Engineering; Software Engineering Major* 09/2009-06/2013

- Related Courses: Data Structure and Algorithms, Algorithmic Design and Analysis, Software Engineering Mathematics, Linear Algebra, Foundation of Computation Theory, Computer Composition, etc.

SELECTED HONORS & AWARDS (national or higher)

- Gold Medal of Asia Regional Contest for the 37th ACM/ICPC 10/2012
- IBM Chinese Excellent Student Scholarship (top 80 in China, per year) 09/2012
- National Scholarship 09/2011

WORK EXPERIENCE

Adobe Inc.

San Jose, California

Research Scientist Intern

05/2022-08/2022

- Built up a GPU-accelerated lossless image compression engine.
- Implemented pure GPU acceleration for GPU friendly modules (e.g., color transformation, prediction, etc) with same bit stream, while using new GPU-friendly architecture like CNN for other modules (e.g., residual distribution estimation).

Amazon.com, Inc.

Seattle, Washington

Applied Scientist Intern

05/2021-08/2021

- Built up a Lidar-based initialization pipeline based on localization algorithms.
- Improved Lidar-based localization with tracking and segmentation. Fuse the information from lidar, tracking and segmentation, remove outliers on moving objects, movable objects in different stages (local map building process, global mapping process, etc).
- Built an auto parameter-tuning framework for general tasks.

Baidu, Inc. (USA)

Sunnyvale, California

Research Intern

07/2020-08/2020

- Built up a pipeline for the image-based emergency vehicle detection feature in Apollo system, including data collection and labeling tool, model design, offline training, online inference, test cases, and engineering-level optimization (ONNX, tensorRT).

Beijing Bytedance Technology Co., Ltd. (USA)

Palo Alto, California

Research Intern

05/2019-08/2019

- Optimized the Landmark AR system, including data collection process, model building module, online localization and tracking module, landmark choosing rules, etc. The Landmark AR features are integrated into the Tik-Tok application in October, which is a mobile software that has nearly 320 million DAU.

HiScene Information Technology Co., Ltd.

Shanghai

Technical Manager

09/2015-07/2018

- Led the team to accomplish algorithm study, algorithm implementation, performance optimization of the algorithm in various platforms, etc. Algorithms include image recognition and tracking with pose estimation, SLAM, item recognition with deep learning, other AR related algorithms, etc.
- Accumulated experience on computer vision algorithms, engineering processes like software architecture designing and code optimizing, as well as leadership and team management.

SZ DJI Technology Co., Ltd.

Shenzhen, Guangdong

Computer Vision Engineer

05/2014-08/2015

- Implemented or improved the vision algorithms used on unmanned aerial vehicles, including visual odometer, obstacles avoiding and simultaneous localization and mapping. Lead a team to build the stereo camera calibration system (which is widely used on Phantom series and all later drone products in DJI), etc.

- Obtained deep recognition on pose estimation with vision information, camera calibration, etc.

Tencent Technology (Shenzhen) Co., Ltd.

Shanghai

Software Engineer

07/2013-04/2014

- Developed new features of back-end and maintained a high-performance system for an online shopping platform, which could support over hundreds of millions of users online simultaneously.
- Obtained technology to build high-performance systems supporting a huge number of users.

SELECTED PROJECTS

QQ-AR Project (in HiScene)

03/2016~08/2016

- A cooperation project between Tencent and HiScene, during the Olympic Games in 2016. As an AR (Augmented Reality) technology provider, our team customized a special version of our commercial AR SDK for them, which had features like recognition and tracking, and had high performance, impressive effects, small size and other advantages. This project applied for a Guinness World Record, which is “Most scans of an Augmented Reality (AR) image in 24 hours”. In this project, I played the role of technical leader in HiScene.

Stereo Calibration Project (in DJI)

04/2014~08/2015

- The first stereo project in DJI, to support the first stereo vision system. Our team improved the stereo calibration algorithm and user calibration process, to make the general user calibration possible. The improved algorithm applied for patents all over the world, and was awarded as one of the key patents in DJI, while the first author is me. Our team also built the first stereo calibration pipeline in the factory of DJI, and provided related software to factory and general users to calibrate the stereo cameras. I was the direct leader of this project.

PUBLICATIONS

Auxiliary Modality Learning with Generalized Curriculum Distillation

ICML 2023

- **Yu Shen**, Luyu Yang, Xijun Wang, Ming C. Lin
- A novel framework that can improve performance with paired auxiliary modality data only during training, in a curriculum way.

Small-shot Multi-modal Distillation for Vision-based Autonomous Steering

ICRA 2023

- **Yu Shen**, Luyu Yang, Xijun Wang, Ming C. Lin
- A novel multi-modal distillation framework that can improve performance with only a small number of auxiliary modality data during training.

Inverse Reinforcement Learning with Hybrid-weight Trust-region Optimization and Curriculum Learning for Autonomous Maneuvering

IROIS 2022

- **Yu Shen**, Weizi Li, Ming C. Lin
- A novel inverse reinforcement learning algorithm, imposing non-uniform priors on task-critical features with hybrid-weight trust-region optimization and utilizing curriculum learning.

Gradient-Free Adversarial Training Against Image Corruption for Learning-based Steering

NIPS 2021

- **Yu Shen**, Laura Zheng, Manli Shu, Weizi Li, Tom Goldstein, Ming C. Lin
- A simple yet effective framework for improving the robustness of learning algorithm against image corruptions.

Adversarial Differentiable Data Augmentation for Autonomous Systems

ICRA 2021

- Manli Shu, **Yu Shen**, Ming C. Lin, and Tom Goldstein
- A robust optimization method for hardening control systems against image corruptions and other unexpected domain shifts.

GAN-based Garment Generation Using Sewing Pattern Images

ECCV 2020

- **Yu Shen**, Junbang Liang, Ming C. Lin
- The first image-based garment generative model which supports most garment topologies and patterns, human body shapes and sizes, and garment materials.

SELECTED PATENTS

Binocular Camera Calibration (First Author)

- A creative method that can allow the general users calibrate the stereo camera accurately and easily.
- Applied in US (US 15/491,858), China (CN 201480075081.X), Europe (EP 14905290.4), Japan (JP 2016-545318), and PCT (PCT/CN2014/090217), etc.

GUINNESS WORLD RECORD

Most scans of an Augmented Reality (AR) image in 24 hours (Participant)

08/2016

- The most scans of an Augmented Reality (AR) image in 24 hours is 1,211,425 times and was achieved by Tencent QQ (China) on 5 August 2016. The campaign on QQ was held across the Olympic Games and ran until the end of the Games. I was the technical leader of the algorithm team in HiScene, the cooperator of Tencent in this project.

SKILLS

- C/C++, CMAKE, Visual Studio, MATLAB, Python, Pytorch, PHP, Continuous Integration, OpenCV, ROS, etc.