JIAHAO YU

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2810 Jackson Ave, Long Island City, NY, 11101

EDUCATION

New York University — New York City, NY, USA
Master of Science, Computer Engineering (STEM), **GPA: 3.89/4.00** — Sep 2021 - May 2023

Donghua University — Shanghai, CN
Bachelor of Engineering, Automation, **GPA: 3.46/5.00 (Top 20%)** — Sep 2017 - Jun 2021
Awards: Academic Merit Scholarship (top 10%), DHU, September 2018 || Outstanding Engineer Scholarship (top 20%), DHU, September 2020 and April 2021 || Academic Competition Scholarship. DHU, September 2020

SKILLS

Machine Learning	Pytorch	TensorRT	Deep Learning	HPC ML	CUDA
Python	MATLAB	C/C++	JAVA	Data Structure	NumPy
Image Processing	OpenCV	Depth Estimation	Signal Processing	Optimization	Embedded System
System Design	TCP/IP	Operating System	Linux	Linear Algebra	Microsoft Office

WORK EXPRIENCE

PinOn, Inc — New York City, NY, USA
Computer Vision Engineering Intern — Dec 2021 – Feb 2022

- **Algorithms Design**: Apply computer vision algorithms such as yolov5, U-net as well as some OpenCV algorithms to evaluate the product quality in production lines, And generate feedback to improve the efficiency of the factory.
- **Algorithms Optimization**: Transform the algorithms to Nvidia Jetson Platform. Optimizing the algorithm using TensorRT to run the algorithm in a real-time embedded system.

PROJECTS

Self-supervised depth estimation in the 3D game: GTA V
Project Leader — Feb 2022-Ongoing

- Modified Grand Theft Auto V using C# scripts and using game native API to simulate a pair of cameras in the game to get the data for neural network training.
- Constructed a self-supervised depth estimation model that uses a virtual camera's image as input to the model. For backward propagation computation, uses depth image and spatial relation to reconstruct the other virtual camera's image to compute loss.

Monocular depth estimation based on defocus information learning
Graduation Thesis — Nov 2020- Jun 2021

- Proposed a monocular estimation neural network that used the information of different blur degrees when the camera is too close and out of focus to image the objects at different distances.
- Applied an Encoder-Decoder neural network structure. Two Encoder are pretrained Resnet, their high-level features at different network depths are combined and input into an upsampling decoder network.
- Achieved better metrics than several representative similar jobs in recent years.

Convolution Optimization: Input High-Dimensional Expansion Convolution
Independent Researcher — Jun 2020 - Nov 2020

- Proposed a GEMM-based optimization algorithm to increase the computational speed of special convolution where convolutional kernel weight varies with convolution kernel positions on the image.
- Expanded the image to the convolution kernel dimension and optimized the expansion method to vectorize and enhance operation efficiency.
- Increased the speed by 20 times by applying the algorithm to the Gaussian Filter rendering and Bilateral Filter rendering.

Yolov5 for virus classification and counting
Project Leader — Nov 2021 - Ongoing

- Labeled the virus photos taken by the electron microscope, and process them for network training.
- Apply the neural network in the Fudan University virus laboratory to help researchers with their daily experiments.

PUBLICATION

- **J. Yu**, "Input High-Dimensional Expansion Convolution: Convolution Optimization for Spatially Varying Convolution" 2021 2nd International Conference on Computing and Data Science (CDS), 2021, pp. 165-170, Doi: 10.1109/CDS52072.2021.00036.

LEADERSHIP AND ACTIVITIES

Student Information Communication Center, Student Union of DHU
Vice President — Sep 2018 - Jun 2019

- Coordinated the operation of official accounts on Weibo and WeChat to promote campus activities.
- Running a social media platform account that attracted over 3000 followers.