

# Yin Daheng

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## Education

### Southeast University

Master of Science  
Major: Computer Science  
2020.09~2023.06  
GPA 3.59/4

### Cambridge University

Overseas study tour  
2017.08-2017.09

### Jiangnan University

Bachelor of Engineering  
Major: IoT Engineering  
2016.09~2020.09  
GPA 81.69/100

## English

IELTS 6.5  
CET6 576

## Skills

Pytorch  
CUDA • TensorRT  
WebRTC • LibVPX  
Docker • Kubernetes  
Git • Github • GitLab  
LaTeX • Golang • Java

## Links

Github@yindaheng98  
Blog:yindaheng98.top

## Research & Development

### Accelerate live video super-resolution with edge computing 2021.06~currently

- Derived a parallel-friendly DNN architecture from a multi-scale feature extraction structure for better multi-device acceleration in the edge environment.
- Dimensionally compressed and int8 quantized intermediate features of the DNN and encoded features into a video stream for transmission among multiple devices.
- Enhance the video decoder to combine low-framerate high-definition stream and high-framerate low-definition stream into high-framerate high-definition streams for smooth video playback when frame-by-frame super-resolution inference is not supported.
- Control the inference process adaptively based on the variable batch size of DNN input and enhanced video decoder to achieve the best video quality under a specific latency bound in dynamic edge environments.
- Implement low-latency video stream routing and dynamic topology control across multiple devices based on WebRTC.
- Related paper D. Yin et al., "WAEVSR: Enabling collaborative live video super-resolution in wide-area MEC environment," is submitted to WWW 2023

## Cooperated Research & Development

### Adaptively computational routing based on environmental awareness in

#### Compute First Network (CFN) 2020.10~2020.12

- Optimize the strategy of 1) DNN layer segmentation for distributed deployment, 2) computing device selection, 3) data transmission path selection.
- My contribution: Development of DNN inference control testbed (DNet), which can schedule and synchronize inference process among multiple computing devices.
- Related paper: X. Guo et al., "Exploiting the computational path diversity with in-network computing for MEC," 2022 19th Annual IEEE International Conference on Sensing, Communication, and Networking (SECON), 2022, pp. 1-9.

## Projects

### Contest TensorRT Hackathon 2022 Winner Prize 2022.03~2022.5

NVIDIA | Alibaba Cloud TIANCHI

- Quantize a speech recognition DNN WeNet and a super-resolution DNN ELAN to FLOAT16 and INT8 using TensorRT.
- Implement FLOAT16 BatchNorm as a TensorRT plugin to replace native TensorRT BatchNorm kernel with precision issues.
- Search and omit the quantization on those layers that have a significant impact on precision in FLOAT16 quantized ELAN structure, which decreases the error by 75% and has a similar speedup.
- Quantized ELAN to INT8 with QAT, which achieved  $2\times$  speedup.
- Github: [github.com/liu-mengyang/trt-wenet](https://github.com/liu-mengyang/trt-wenet) and [github.com/liu-mengyang/trt-elan](https://github.com/liu-mengyang/trt-elan)

### Contest TensorRT Hackathon 2021 Ranking 4/48 2021.03~2021.5

NVIDIA | Alibaba Cloud TIANCHI

- Quantize a multi-object tracking DNN FairMOT to FLOAT16 and INT8 using TensorRT.
- Implement FLOAT16 DCNv2 kernel as a TensorRT plugin, which achieved  $2.36\times$  speedup.
- Import and align model parameters from Pytorch into TensorRT through API.
- Github: [github.com/liu-mengyang/trt-fairmot](https://github.com/liu-mengyang/trt-fairmot)

## Contest & Scholarship During Undergraduate

2020.06	Outstanding Graduate of Jiangnan University	
2018.09	National College Mathematical Contest in Modeling	2nd Prize(National)
2017.11	9th National College Mathematical Contest	2nd Prize(Provincial)
2017.11	China National Scholarship (2016-2017)	
2017.05	14th Jiangsu College Mathematical Contest	1st Prize