

Jialing Lyu

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EDUCATION

Rice University

Master of Electrical & Computer Engineering, (Current GPA 3.72)

Houston, Texas

09/2020 - 12/2022

University of Science & Technology of China

Bachelor of Automation Engineering, (GPA 3.81)

Hefei, China

09/2016 - 06/2020

SKILLS

Languages: Python, JavaScript, HTML, CSS, MATLAB, shell scripting

Frameworks: PyTorch, TensorFlow, NumPy, OpenCV, Vue.js, Node.js, Express, MongoDB

Tools: UnrealCV, CommPy, SoapySDR, Numba, imgaug, Element UI, Multer, Axios, SheetJS, Nodemailer

Knowledge: Machine Learning, Deep Learning, Computer Vision, Activity Recognition, Network Architecture Search, Efficient Model Training, Distributed Systems, Wireless Communication

INTERNSHIP EXPERIENCE

Activity Recognition Model Analysis

Jul 2019 – Aug 2019

Summer Research Intern, Johns Hopkins University

- Developed a pipeline to analyze **Temporal Segment Network** and **Inflated 3D ConvNet** with **PyTorch**.
- Calculated TSN's accuracy drop with various perturbations using **OpenCV-python** and **imgaug** library.
- Proved TSN overfits to background objects and textures using **Mask R-CNN** and **class activation map**.
- Revealed TSN's and I3D's reliance on video viewpoints and human appearance using **UnrealCV** and **PCA**.

Differentiable Neural Architecture Search Recipe

Sep 2020 – Nov 2020

Research Assistant, Rice University

- Built a **PyTorch** DNAS framework to control training strategies for **cell-based** and **block-based** search.
- Reduced #FLOPS of Differentiable Architecture Search (**DARTS**) by **57.6%** same accurately on ImageNet.
- Increased the accuracy of Facebook-Berkley-Net-A (**FBNet-A**) by **2.4%** same efficiently on ImageNet.
- Proved that **Gumbel Softmax** and **joint optimization** combine to be the best for block-based search.

Learning-Based Uplink Symbol Detection

Sep 2021 – May 2022

Research Assistant, Rice University

- Simulated MIMO wireless systems with **CommPy** and collected uplink OFDM symbols with **SoapySDR**.
- Implemented detector with learned denoiser using **TensorFlow** and reduced the required SNR by **1dB**.
- Implemented detector with learned factor graph using **MATLAB** and reduced the required SNR by **1dB**.
- Reduced the required SNR of Iterative Soft Interference Cancellation by **2dB** using **NumPy** and speeded up running by **30 times** using **Numba** in a 10-to-10 system on Rayleigh Fading Channel with QAM4.

PROJECTS

Precision Scheduler: Efficient Dynamic Training

Feb 2021 – Mar 2021

- Implemented **ResNet**, **MobileNetV2** with quantized weights/activations and cosine precision scheduler.
- Reduced ResNet-74's GBitOPs by **37.1%** and latency by **21.4%** with 3-8 bits scheduler on CIFAR-100.
- Reduced MobileNetV2's GBitOPs by **21.0%** and latency by **14.7%** with 4-6 bits scheduler on CIFAR-100.
- Improved ResNet-18's accuracy by **0.91%** to full precision peer with 8-32 bits scheduler on ImageNet.

Course E-Assistant: Node.js/MongoDB/Vue.js based Web Service

Jul 2021 – Aug 2021

- Implemented a web service with Javascript, HTML and CSS on **CVM** of **Tencent Cloud** to assist teachers.
- Designed the frontend with **Vue.js**, **Element UI** and **Axios** for users to view, post, upload and download.
- Developed the REST API with **Node.js**, **Express**, **Multer** and **MongoDB** database on **TencentDB**.
- Enabled exporting scores sheet with **SheetJS** and sending emails to receiver list with **Nodemailer**.

PUBLICATION

- J. Lyu, W. Qiu, and A.Yuille, "Identity Preserve Transform: Understand What Activity Classification Models Have Learnt," 2020 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshop, 2020.