Yukun Ma

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Education

Northwestern University, Evanston, USA — Sep. 2019 – Dec. 2020

M.S. in Computer Science; overall GPA: 4.0 / 4.0; admitted into PhD program then transferred to MS program

Harbin Institute of Technology, Harbin, China — Sep. 2015 – Jun. 2019

B.E. in Computer Science with Honors; overall GPA: 3.70 / 4.0

Skills

- Programming Languages: C/C++, Python, Java, Scala, JavaScript, HTML, CSS, Latex, Emacs Lisp, R
- Framework and Tools: Kubernetes, MySQL, Django, MongoDB, ROS, React, Git, PyTorch, TensorFlow

Relevant Experience

Learning N:M Fine-grained Structured Sparse Neural Networks From Scratch — Jul. 2020 – Oct. 2020

Technology: Python, PyTorch; **Link**: https://openreview.net/pdf?id=K9bw7vqp_s

- Designed a training method to train a convolutional neural networks with n:m structural sparsity from scratch.
- Trained ResNet-18 and ResNet-50 with the proposed method from scratch, maintaining similar performance while reducing the expected inference time nearly by half on NVIDIA A100.
- Submitted to International Conference on Learning Representations (ICLR) 2021.

Text2Image, a React Native app generating images from texts — May 2020 – Aug. 2020

Technology: JavaScript, React Native, Python, PyTorch, Django

- Implemented a React Native app that can generate realistic images from users' text inputs.
- Hosted a load-balanced Django backend to serve machine learning models for requests from frontends.

Simulational Inference, Northwestern University — Sep. 2019 - Feb. 2020

Advisor: Prof. Han Liu; Technology: Python, PyTorch, OCR, Object Detection, Bi-level Optimization

- Implemented a simulation-memorization-calibration framework for optical character recognition that utilizes simulated data for model training and real-world data to calibrate the simulator's parameters.
- Improved the F1-score on SROIE dataset by 6.77% compared with models trained without this framework.

Research Intern, Sensetime Group — Sep. 2018 – Aug. 2019

Advisors: Prof. Ping Luo, Dr. Guangliang Cheng; Technology: Python, C++, Machine Learning

- Worked in the autonomous driving team cooperating with Honda of Japan and CUHK - Sensetime Joint Lab.
- Increased mIOU metrics on semantic segmentation tasks for autonomous driving (at most 27.8% for some labels) by augmenting datasets with style transferring and fully utilizing training data from different domains.
- Designed and implemented Consistent Normalization and improved the performance of ResNet-50 backbone neural network on ImageNet dataset by +1.7% without extra computation load via the proposed method.
- Developed evaluation tools for scene perception pipeline, supporting both Caffe2 and PyTorch.

SAM – Sparse Additive Machine, Google Summer of Code project — Jun. 2018 – Sep. 2018

Advisor: Prof. Tuo Zhao; Technology: C++, R, Parallel Computing

- An R package for general linear models with lasso regularizers, downloaded over **28,000 times**.
- Utilized state-of-the-art methods such as proximal Newton method, MCP regularizer, homotopy, and covariance update.
- Decreased errors of linear regression by 24% and time of logistic regression by 90%.
- Accelerated with C++ backend and OpenMP to be faster than popular R packages such as grplasso and grpreg.

Honors and Awards

341st Place out of 27200 participators, Award on Round 3 of Google Code Jam 2016 — Jun. 2016

Gold Medal (Top 10%), Award on **ACM-ICPC Asia Regional Contests** (3 times / 3 participations) — 2016/2017

Championship, Award on **CCPC Provincial and MultiProvincial Programming Contest** (3 times) — 2016/2017