YUCHEN LIU

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EDUCATION

Princeton University — September 2017 – Present
Doctor of Philosophy in Electrical Engineering (expected August 2022) — *Princeton, NJ, U.S.*
Research interest: Deep Learning, Computer Architecture
Supervisor: Prof. S.Y. Kung and Prof. David Wentzlaff

Hong Kong University of Science and Technology — September 2013 – June 2017
Bachelor of Engineering in Electronic Engineering — *Hong Kong*
Minor: Business, Information Technology
Major GPA: 4.078/4.30

Massachusetts Institute of Technology — June – August 2016
Summer Research Student — *Cambridge, MA, U.S.*
Supervisor: Prof. Dina Katabi

PUBLICATIONS

P.1. **Yuchen Liu**, Zhixin Shu, Yijun Li, Zhe Lin, Federico Perazzi, and S.Y. Kung. "Content-Aware GAN Compression". Under Review.

P.2. **Yuchen Liu**, S.Y. Kung and David Wentzlaff. "Evolving Transferable Pruning Functions". Under Review.

P.3. **Yuchen Liu**, David Wentzlaff and S.Y. Kung. "Rethinking Class-Discrimination Based CNN Channel Pruning". (*arxiv*)

P.4. S.Y. Kung, Zejiang Hou and **Yuchen Liu**. "Methodical Design and Trimming of Deep Learning Networks: Enhancing External BP learning with Internal Omnipresent-Supervision Training Paradigm". In Proceedings of the *International Conference on Acoustics, Speech, and Signal Processing, ICASSP 2019.* (*pdf*)

P.5. Chen-Yu Hsu, **Yuchen Liu**, Zachary Kabelac, Rumen Hristov, Dina Katabi, and Christine Liu. "Extracting Gait Velocity and Stride Length from Surrounding Radio Signals". In Proceedings of the *Conference on Human Factors in Computing Systems, CHI 2017.* (*pdf*)

SELECTED COURSES

Machine Learning and Pattern Recognition (A), Neural Networks: Theory and Application (A), Computer Vision (A), Kernel-Based Machine Learning (A), Digital Neurocomputing (A), Linear and Non-Linear Optimization (A), Information Theory (A) (Graduate courses at Princeton University with letter grades)

RESEARCH EXPERIENCE

Content-Aware GAN Compression — June 2020 – Present
Supervisor: Dr. Zhixin Shu — *Adobe Research, Adobe, U.S.*

- Develop a content-aware strategy to compress state-of-the-art generative adversarial networks (GANs), StyleGAN2.
- Keyword: StyleGAN2, network compression, image editing. Paper under review.

Evolving Neural Networks for Memory Prefetching — September 2020 – Present
Supervisor: Prof. David Wentzlaff — *ELE Dept., Princeton University, U.S.*

- Evolve neural network structures for memory prefetching.
- Keyword: SPEC CPU benchmark, evolution strategy, workload analysis, memory access pattern.

Evolving Transferable Pruning Functions — August 2019 – June 2020
Supervisor: Prof. David Wentzlaff — *ELE Dept., Princeton University, U.S.*

- Learn novel and transferable closed-form pruning functions by an evolution strategy.
- Functions evolved on small datasets (e.g., CIFAR) are transferable to more challenging one (e.g., ImageNet).
- Keyword: MobileNet-V2, channel pruning, genetic programming. Paper under review.

Rethinking Class-Discrimination Based CNN Channel Pruning — August 2019 – April 2020
Supervisor: Prof. S.Y. Kung — *ELE Dept., Princeton University, U.S.*

- Generalize uni-variate two-class discriminant functions for deep convolutional network's channel pruning.
- Keyword: ResNet-50, channel pruning, discriminant functions. Paper at (*arxiv*).

Methodical Design and Trimming of Deep Learning Networks August 2018 – Feburary 2019
Supervisor: Prof. S.Y. Kung *ELE Dept., Princeton University, U.S.*

- Introduce an internal omnipresent-supervision training paradigm for neural network's growing and trimming.
- Keyword: Channel pruning, channel growing, hidden layer's supervision. Paper published in *ICASSP 2019* (*pdf*).

Gait Parameters Extraction Using RF Signal June 2016 – November 2016
Supervisor: Prof. Dina Katabi *CSAIL, MIT, U.S.*

- Extract gait velocity and stride length using wireless signals reflected from the human body.
- Keyword: Wireless sensing, continuous monitoring. Paper published in *CHI 2017* (*pdf*).

SELECTED PROJECTS

Spreadsheet Architecture Model for Neural Net's Performance Estimation July 2019 – September 2019
Supervisor: Prof. David Wentzlaff *ELE Dept, Princeton University, U.S.*

- Build spreadsheet hardware models with architectural configurations to estimate performance of a neural net.
- Keyword: Latency, throughput, memory bandwidth, Pascal GPU architecture.

Cloud-Based Wireless Channel Characterizations June 2016 – May 2017
Supervisor: Prof. Vincent Lau *CenWIT, HKUST, Hong Kong*

- Build a GPS coverage map of wireless signal's strength.
- Keyword: Received signal strength indicator, GPS, maximum likelihood estimator, Android App.

Speech Recognition Eye Test October – December 2015
Supervisor: Prof. Bruce Land *ECE Dept., Cornell University, U.S.*

- Establish an embedded system to perform an entire Snellen eye test by speech recognition.
- Keyword: PIC32 microcontroller, FFT, Mel transform, support vector machine. (*demo*) (*report*).

HONORS & AWARDS

HKUST Outstanding Undergraduate May 2017
Awarded to top 3% of graduating undergraduate students.

The 14th National Challenge Cup, National Round, Third Prize October 2015
Innovation competition joined by more than 2.5 million students from over 3,000 institutions

HKUST 2015 President's Cup, Gold Award June 2015
University undergraduate innovative research competition, involving more than 40 groups of students

The 6th HKUST Robot Design Contest, Silver Prize December 2014
University robot design contest with over 100 participants

Scholarship Scheme for Continuing Undergraduate Students 2013 – 2017
Awarded to the top 5% of students

Dean's List 2014 – 2017
Acknowledgement from HKUST's dean to students with excellent academic performance

HKSAR Reaching Out Award June 2016
Awarded to students with international research experience

EXCHANGE/VISITING

Massachusetts Institute of Technology, MA, U.S. June – August 2016

Cornell University, NY, U.S. August – December 2015

Peking University, Beijing, China June – August 2014

SKILLS & TEST SCORES

Programming	C/C++, Python, HTML/CSS, Javascript, VHDL, Verilog, Android, UNIX shell script
Tools and libraries	TensorFlow, PyTorch, OpenCV, MATLAB, Mathematica, iPython, ROS
Languages	Mandarin (Native), Cantonese (Native), English (Proficient)