Hsin-Pai (Dave) Cheng

Curriculum Vitae

ECE Department
Duke University
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Education

2017–present **PhD, Electrical & Computer Engineering**, *Duke University*, US.
Neural Architecture Search, Machine Learning and Deep Learning

2015–2017 : **Master of Science, Electrical & Computer Engineering**, *University of Pittsburgh*, US.
Neuromorphic Computing, DNN Quantization

2010–2014 : **Bachelor of Science, Mechanical and Electro-Mechanical Engineering**, *National Sun Yat-Sen University*, Taiwan.

Publications

Neural Architecture Search

2021 **Hsin-Pai Cheng**, Tunhou Zhang, Shiyu Li, Feng Yan, Meng Li, Vikas Chandra, Hai Li, and Yiran Chen. Nasgem: Neural architecture search via graph embedding method. In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2021.

2021 **Hsin-Pai Cheng**, Feng Liang, Meng Li, Bowen Cheng, Feng Yan, Hai Li, Vikas Chandra, and Yiran Chen. Scalenas: One-shot learning of scale-aware representations for visual recognition. *arXiv preprint arXiv:2011.14584*, 2021.

2020 Tunhou Zhang, **Hsin-Pai Cheng**, Zhenwen Li, Feng Yan, Chengyu Huang, Hai Helen Li, and Yiran Chen. Autoshrink: A topology-aware nas for discovering efficient neural architecture. In *AAAI*, pages 6829–6836, 2020.

2019 **Hsin-Pai Cheng**, Tunhou Zhang, Yukun Yang, Feng Yan, Harris Teague, Yiran Chen, and Hai Li. Msnet: Structural wired neural architecture search for internet of things. In *Proceedings of the IEEE International Conference on Computer Vision Workshops*, pages 0–0, 2019.

2018 **Hsin-Pai Cheng**, Yuanjun Huang, Xuyang Guo, Yifei Huang, Feng Yan, Hai Li, and Yiran Chen. Differentiable fine-grained quantization for deep neural network compression. *NeurIPS workshop*, 2018.

Distributed Computing

2019 **Hsin-Pai Cheng**, Patrick Yu, Haojing Hu, Syed Zawad, Feng Yan, Shiyu Li, Hai Li, and Yiran Chen. Towards decentralized deep learning with differential privacy. In *International Conference on Cloud Computing*, pages 130–145. Springer, 2019.

2018 **Hsin-Pai Cheng**, Patrick Yu, Haojing Hu, Feng Yan, Shiyu Li, Hai Li, and Yiran Chen. Leasgd: an efficient and privacy-preserving decentralized algorithm for distributed learning. *NeurIPS Privacy Preserving Workshop*, 2018.

System of Machine Learning

2020 Byung Hoon Ahn, Jinwon Lee, Jamie Menjay Lin, **Hsin-Pai Cheng**, Jilei Hou, and Hadi Esmaeilzadeh. Ordering chaos: Memory-aware scheduling of irregularly wired neural networks for edge devices. *arXiv preprint arXiv:2003.02369*, 2020.

2019 **Hsin-Pai Cheng**, Juncheng Shen, Huanrui Yang, Qing Wu, Hai Li, and Yiran Chen. Adverquil: an efficient adversarial detection and alleviation technique for black-box neuromorphic computing systems. In *Proceedings of the 24th Asia and South Pacific Design Automation Conference*, pages 518–525, 2019.

2017 **Hsin-Pai Cheng**, Wei Wen, Chunpeng Wu, Sicheng Li, Hai Helen Li, and Yiran Chen. Understanding the design of ibm neurosynaptic system and its tradeoffs: a user perspective. In *Design, Automation & Test in Europe Conference & Exhibition (DATE), 2017*, pages 139–144. IEEE, 2017.

Research Experience

Facebook Reality Labs, Facebook

Sep,2020 – Dec, 2020 ***Part-time Student Researcher***.
Integrate ScaleNAS to two internal repositories

Manager : **Meng Li**, *Research Scientist*

May,2020 – August,2020 ***Research Intern***.
Develop one-shot neural architecture search tool for semantic segmentation and multi-person human pose estimation.

Manager : **Meng Li**, *Research Scientist*

Qualcomm AI Research, Qualcomm

May,2019 – Aug,2019 ***Research Intern***.
Develop graph-based neural architecture search and compete AI acceleration challenge at ICCV

Manager : **Jinwon Lee**, *Senior Staff Engineer*

Awards

2019 ***3rd place of MicroNet Challenge at NeurIPS 2019***. Compete in ImageNet track to build the most efficient model that has highest compression rate.

2019 ***2rd place of AI acceleration Challenge at ICCV***. Proposed DukeNet, Neural architecture for Qualcomm DSP on mobile phone.

2019 ***1st place of Visual wake words Challeng at CVPR***. Highest accuracy model that uses innovative compression/sparsification techniques for the next-generation embedded devices.

2018 ***3rd place of Low Power Image Recognition Competition at CVPR***

2017 ***Special prize of Low Power Image Recognition Competition at CVPR***

Position of Responsibility

2019 **Student organizer and moderator, Low Power Image Recognition Competition at ICCV**.

2017–present **Reviewer of ICCV, ICML, CVPR, AAAI, NeurIPS, TNNLS, ACM Journal.**.

Teaching Assistantship

Fall, 2020 : **ECE590: Advanced Topics in Electrical and Computer Engineering**, ECE Duke.

Fall, 2018 : **ECE 565: Performance Optimization & Parallelism**, ECE Duke.