WONG, Edwin Kwun Hang 黃冠衡

Mphil(EEE), BEng(EE)
Neuromorphic Computing, SNN, RRAM, Security
The University of Hong Kong, China
(Currently seeking overseas PhD opportunities)

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Paper Publishments

•Resistive memory-based zero-shot liquid state machine for multimodal event data learning
N. Lin, S. Wang, Y. Li, B. Wang, S. Shi, Y. He, W. Zhang, Y. Yu, Y. Zhang, X. Zhang, ***Kwunhang Wong****, S. Wang, X. Qi, X. Chen, H. Jiang, X. Zhang, P. Lin, X. Xu, Q. Liu, Z. Wang, D. Shang, and M. Liu*

– Journal: Nature Computational Science
– Accepted date: None (Pending after 2nd Rebuttal Submission)

•SNNGX: Securing SNNs with Genetic XOR Encryption on RRAM-based Neuromorphic Accelerator
Kwunhang Wong*, Songqi Wang, Wei Huang, Xinyuan Zhang, Yangu He, Karl M.H. Lai, Yuzhong Jiao, Ning Lin, Xiaojuan Qi, Xiaoming Chen, and Zhongrui Wang*

– In International Conference on Computer-Aided Design (ICCAD'24), New Jersey
– Accepted date: 30 Jun 2024 (https://arxiv.org/abs/2407.15152)

•Older and Wise: The Marriage of Device Aging and Intellectual Property Protection of DNNs
Ning Lin, Shaocong Wang, Yue Zhang, Yangu He, ***Kwunhang Wong****, Arindam Basu, Dashan Shang, Xiaoming Chen, and Zhongrui Wang*

– In Design Automation Conference (DAC'24), San Francisco
– Accepted date: 26 Feb 2024 (https://arxiv.org/abs/2406.14863)

•In-memory and In-Sensor Reservoir Computing with Memristive Devices
Ning Lin, Jia Chen, Ruoyu Zhao, Yangu He, ***Kwunhang Wong****, Qinru Qiu, Zhongrui Wang, and J. Joshua Yang*

– Journal: APL Machine Learning (Selected as Journal Cover!!)
– Accepted date: 10 Jan 2024 (https://doi.org/10.1063/5.0174863)

Work Experience

•AI Chip Center for Emerging Smart Systems (ACCESS), HKUST *02/2024-now*
Research Assistant Hong Kong

– RP4.2: Design Secure Machine Learning Accelerator
– Security ASIC co-design, emerging memory, and neuromorphic computing

•Department of Electrical and Electronic Engineering, HKU *06/2021-09/2021*
Research Assistant Hong Kong

– Conservation Voltage Reduction (CVR) application in power industry
– Mathematical modelling on CVR Calculation

•CLP Power Hong Kong Limited *06/2020-06/2021*
Gap-year Internship Hong Kong

– Calculate CVR power/energy saving effect (Matlab)
– Conduct 132/11kV substation network load classification
– Smart grid protocol and potential Volt-Var Optimization (VVO) study

Education

•Mphil (Electrical and Electronic Engineering), HKU ***2023-now***
Co-Supervised by ***Prof.Zhongrui Wang and Prof.Xiaojuan Qi*** CGPA: 4.30
Participated in 3 papers publishment: Neuromorphic Computing, SNN, CiM architecture, Security

•BEng (Major in Electrical Engineering), HKU ***2018-2023***
Course taken: Advanced Robotics, Convex Optimization, Digital Electronics, Power Electronics
Thesis: Evolutionary attack against Spiking neural network (SNN) inherent robustness
CLP Scholarship in Electrical Engineering, Dean's honours list, Reaching Out Award *2019-2020*
UCL, Faculty of Brain Sciences Summer Exchange (grade: 1st) *2018-2019*

Related Projects

•Yolo v8 Object Detection and Segmentation Acceleration *2024*

– DAC System Design Contest 2024
– Hardware acceleration with tensorrt, pruning and quantization

•Weight protection on high performance Binary Neural Networks *2023*

– Design Binarised NN models trained by Straight-through Estimator, Hyperdimensional Computing models
– Methods: Fast gradient sorting methods, Genetic weight search methods, Hessian strategic estimation, etc.

Technical Skills and Interests

Languages: Chinese, English, Japanese (N3)
Developer Tools: Matlab, LaTex, Python/C++/Java, Verilog
Frameworks: PyTorch, SpikingJelly, SpyTorch, Torchhd
Areas of Interest: ReRAM, SNN, Hardware protection

Positions of Responsibility

•External Vice-Chairperson, HKU Golf Club (Founding Committee) *2023-now*

•Winter 2022 Entrepreneur, Hong Kong innoX Academy (HKSTP x HKUST) *2021*

•Overall Champion, Ricci Hall Sports Team (Aquatics, Basketball, Softball) *2019, 2023, 2024*

Achievements

•IEEE Blockchain HK Web3.0 Developer Hackathon 2022 (Most Innovative Award) *08/2022*

•"Challenge Cup" National College Students' Extracurricular Academic Science and Technology Contest (Smart Grid Control)(Bronze Prize) *07/2022*