



# WONG, Edwin Kwun Hang 黃冠衡

Mphil(EEE), BEng(EE)

Neuromorphic Computing, SNN, RRAM, Security

The University of Hong Kong, Hong Kong SAR

(Currently seeking overseas PhD opportunities)

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GitHub Profile

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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: 26 Nov 2024
- **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>)(Acceptance rate: 195/802=24.3%)
- **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>)(Acceptance rate: 263/1156=22.7%)
- **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 4 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

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- **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

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**Languages:** Cantonese, Mandarin, 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

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- **External Vice-Chairperson**, HKU Golf Club (Founding Committee) *2023-now*
- **Python Programming Instructor**, SKH Bishop Baker Secondary School *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

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- **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*