# Pingcheng Dong

*Curriculum Vitae*

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## Education

2022-present **PhD in Electronic and Computer Engineering**, *The Hong Kong University of Science and Technology (HKUST), Hong Kong, China. AI Chip Center for Emerging Smart Systems*, supervised by Prof. Tim Kwang-Ting CHENG..

2018-2022 **B.E. in Microelectronics Science and Engineering**, *Experimental Class, School of Microelectronics, Southern University of Science and Technology (SUSTech), Shenzhen, China*, GPA: 3.84/4.0, Rank: 4/93, supervised by Prof. Fengwei An..

## Research Interests

Stereo vision, image processing, machine learning, hardware acceleration for vision algorithm, low-power and high-performance VLSI circuit design.

## Research Experiences

2022-present **NAS and DSE Co-design Based Transformer Accelerator**.

- Researching in designing domain-specific transformer accelerator through software and hardware co-design methodology.

2021-2022 **ASIC design of stereo depth coprocessor in 28nm CMOS technology**.

- Developed a pixel-level pipeline hardware architecture of proposed region-optimized semi-global matching algorithm.

2020-2021 **ASIC design of low-visibility enhancement accelerator in 180nm CMOS technology**.

- In charge of front-end and back-end design of top architecture and I2C circuits.

2019-2020 **Hardware accelerator for stereo vision algorithm**.

- Proposed a region-optimized stereo matching strategy improving the speed of traditional semi-global matching algorithm by 5 times while ensuring the accuracy.
- Proposed a four-layer parallel pipeline hardware architecture and implemented it on FPGA platform which can extract depth information in real-time at 156MHz and 508fps under VGA resolution.

## Publications

2022 **Pingcheng Dong**, Zhuoao Li, Zhuoyu Chen, Ruoheng Yao, Wenyue Zhang, Yangyi Zhang, Lei Chen, Chao Wang, Fengwei An. Configurable Image Rectification and Disparity Refinement for Stereo Vision, *IEEE Transactions on Circuits and Systems II: Express Briefs*, doi: 10.1109/TCSII.2022.3191811.

2022 Ruoheng Yao, Lei Chen, **Pingcheng Dong**, Zhuoyu Chen, Fengwei An. A Compact Hardware Architecture for Bilateral Filter with the Combination of Approximate Computing and Look-up Table, *IEEE Transactions on Circuits and Systems II: Express Briefs*, doi: 10.1109/TCSII.2022.3159261.

2021 **Pingcheng Dong**, Zhuoyu Chen, Zhuoao Li, Yuzhe Fu, Lei Chen, Fengwei An. A 4.29nJ/pixel Stereo Depth Coprocessor With Pixel Level Pipeline and Region Optimized Semi-Global Matching for IoT Application, *IEEE Transactions on Circuits and Systems I: Regular Papers*, doi: 10.1109/TCSI.2021.3100071.

2021 **Pingcheng Dong**, Zhuoao Li, Zhuoyu Chen, Ruoheng Yao, Huanshihong Deng, Wenyue Zhang, Yangyi Zhang, Lei Chen, Chao Wang, Fengwei An. A 139 fps pixel-level pipelined binocular stereo vision accelerator with region-optimized semi-global matching, *2021 IEEE Asian Solid-State Circuits Conference (A-SSCC)*, doi: 10.1109/A-SSCC53895.2021.9634805.

2021 Zhuoyu Chen, **Pingchen Dong**, Zhuoao Li, Ruoheng Yao, Yunhao Ma, Xiwei Fang, Huanshihong Deng, Wenyue Zhang, Lei Chen, Fengwei An. Real-Time FPGA-Based Binocular Stereo Vision System with Semi-Global Matching Algorithm, *2021 IEEE* $34^{th}$ *International System-on-Chip Conference (SOCC)*, doi: 10.1109/SOCC52499.2021.9739626.

2020 Huanshihong Deng, **Pingcheng Dong**, Zhuoao Li, Haoran Lyu, Yangyi Zhang, Yiwei Luo, Fengwei an. Robot navigation based on pseudo-binocular stereo vision and linear fitting, *The 2020 IEEE International Conference on Integrated Circuits, Technologies and Applications (ICTA)*, doi: 10.1109/ICTA50426.2020.9332014.

## Honors & Awards

2022 Hong Kong PhD Fellowship

2022 HKUST RedBird PhD Scholarship

2022 Outstanding Graduate in the College of Engineering, SUSTech

2021 China National Scholarship (Top 8 in SUSTech)

2021 Scientific Research Star (Top 1 in Shuren College)

2021 Shenzhen Longsys Electronics Company Award

2021 Best Presentation Award in IEEE CASS Shanghai and Shenzhen Joint Workshop

2020 The First Prize of Outstanding Students in SUSTech (Top 5% in SUSTech)

## Skills

C++, JAVA, Python, Verilog, Chisel, MATLAB