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Areas of specialization

- Neuromorphic Computing
- Deep Learning
- Low-power VLSI
- Post-CMOS Device

Education

- 2020 **PH.D., Electrical Engineering**
🏛️ Arizona State University, Tempe, AZ, US
THESIS: “Efficient and Secure Deep Learning Inference System: A Software and Hardware Co-Design Perspective”
ADVISOR: [Deliang Fan](#)
- 2015 **M.ENG., Electrical and Computer Engineering**
🏛️ Oregon State University, Corvallis, OR, US
- 2012 **B.S., Information Engineering**
🏛️ Southeast University, Nanjing, Jiangsu, CHN

Professional experience

- 2020 Assistant Professor (Tenure track)
Dept. of Computer Science and Engineering, Shanghai Jiao Tong University
- 2019 Research Scientist Intern
Machine Learning System Group, [ByteDance AI Lab](#)
- 2016-2020 Research & Teaching Assistant
Arizona State University & University of Central Florida

Grants, Honors & Awards

- 2022 Best Paper Award, IEEE Design, Automation and Test in Europe Conference
- 2022 Shanghai High-level Talent Program (¥750K)
- 2020 Explore-X Foundation Talent Project (¥450K grant)
- 2020 Engineering Graduate Fellowship, Arizona State University
- 2020 [University Graduate Fellowship \(UGF\)](#), Arizona State University (only recipient of ECEE)
- 2019 TECHCON travel grant, Semiconductor Research Corporation
- 2019 ACM SIGDA scholarship for Ph.D. forum, Design Automation Conference

2018
2017
2014




Best Paper Award, IEEE Computer Society Annual Symposium on VLSI
Best Paper Award, IEEE Computer Society Annual Symposium on VLSI
ISAS scholarship, Oregon State University

Publications & Presentations

= indicates equal contribution among authors.

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JOURNAL

- [J1] Chen Nie, Chenyu Tang, Jie Lin, Huan Hu, Chenyang Lv, Ting Cao, Weifeng Zhang, Li Jiang, Xiaoyao Liang, Weikang Qian, Yanan Sun, and Zhezhi He. “VSPIM: SRAM Processing-in-Memory DNN Acceleration via Vector-Scalar Operations”. In: *(TC) IEEE Transactions on Computers* (2023).
- [J2] Fangxin Liu, Zongwu Wang, Yongbiao Chen, Zhezhi He, Tao Yang, Xiaoyao Liang, and Li Jiang. “SoBS-X: Squeeze-Out Bit Sparsity for ReRAM-Crossbar-Based Neural Network Accelerator”. In: *(TCAD) IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems* (2022).
- [J3] Li Yang, Zhezhi He, Yu Cao, and Deliang Fan. “A Progressive Subnetwork Searching Framework for Dynamic Inference”. In: *IEEE Transactions on Neural Networks and Learning Systems* (2022).
- [J4] Tao Yang, Hui Ma, Xiaoling Li, Fangxin Liu, Yilong Zhao, Zhezhi He, and Li Jiang. “DTA-Trans: Leveraging Dynamic Token-based Quantization with Accuracy Compensation Mechanism for Efficient Transformer Architecture”. In: *(TCAD) IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems* (2022).
- [J5] Adnan Siraj Rakin, Zhezhi He, Jingtao Li, Fan Yao, Chaitali Chakrabarti, and Deliang Fan. “T-BFA: Targeted bit-flip adversarial weight attack”. In: *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)* (2021).
- [J6] Yanan Sun, Chang Ma, Zhi Li, Yilong Zhao, Jiachen Jiang, weikang Qian, Rui Yang, Zhezhi He, and Li Jiang. “Unary Coding and Variation-Aware Optimal Mapping Scheme for Reliable ReRAM-based Neuromorphic Computing”. In: *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)* (2021), pp. 1–1. DOI: [10.1109/TCAD.2021.3051856](https://doi.org/10.1109/TCAD.2021.3051856).
- [J7] Tao Yang, Zhezhi He, Tengchuan Kou, Qingzheng Li, Qi Han, Haibao Yu, Fangxin Liu, Yun Liang, and Li Jiang. “BISWSRBS: A Winograd-based CNN Accelerator with a Fine-grained Regular Sparsity Pattern and Mixed Precision Quantization”. In: *ACM Transactions on Reconfigurable Technology and Systems (TRETS)* 14.4 (2021), pp. 1–28.
- [J8] Shaahin Angizi, Zhezhi He, An Chen, and Deliang Fan. “Hybrid Spin-CMOS Polymorphic Logic Gate With Application in In-Memory Computing”. In: *IEEE Transactions on Magnetics* 56.2 (2020), pp. 1–15. .
- [J9] Durjoy Dev, Adithi Krishnaprasad, Mashiyat Shawkat, Zhezhi He, Sonali Das, Hee-Suk Chung, Deliang Fan, Yeonwoong Jung, and Tania Roy. “2D MoS₂ Based Threshold Switching Memristor For Artificial Neuron”. In: *IEEE Electron Device Letters* (2020). .
- [J10] Zhezhi He, Li Yang, Shaahin Angizi, Adnan Siraj Rakin, and Deliang Fan. “Sparse BD-Net: A Multiplication-less DNN with Sparse Binarized Depth-wise Separable Convolution”. In: *ACM Journal on Emerging Technologies in Computing Systems (JETC)* 16.2 (2020), pp. 1–24. .





















- [J11] Xiaolong Ma, Sheng Lin, Shaokai Ye, Zhezhi He, Linfeng Zhang, Geng Yuan, Sia Huat Tan, Zhengang Li, Deliang Fan, Xuehai Qian, et al. “Non-Structured DNN Weight Pruning—Is It Beneficial in Any Platform?” In: *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)* (2020). (Accepted) [📄](#).
- [J12] Shaahin Angizi, Zhezhi He, Amro Awad, and Deliang Fan. “MRIMA: An MRAM-based In-Memory Accelerator”. In: *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems* (2019). [📄](#).
- [J13] Zhibo Wang, Zhezhi He, Milan Shah, Teng Zhang, Deliang Fan, and Wei Zhang. “Network-based multi-task learning models for biomarker selection and cancer outcome prediction”. In: *Oxford academic Bioinformatics* (2019). [📄](#).
- [J14] Shaahin Angizi, Zhezhi He, Nader Bagherzadeh, and Deliang Fan. “Design and Evaluation of a Spintronic In-Memory Processing Platform for Nonvolatile Data Encryption”. In: *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems* 37.9 (2018), pp. 1788–1801. [📄](#).
- [J15] Zhezhi He, Yang Zhang, Shaahin Angizi, Boqing Gong, and Deliang Fan. “Exploring A SOT-MRAM based In-Memory Computing for Data Processing”. In: *IEEE Transactions on Multi-Scale Computing Systems* (2018). [📄](#).
- [J16] Farhana Parveen, Shaahin Angizi, Zhezhi He, and Deliang Fan. “IMCS2: Novel Device-to-Architecture Co-Design for Low-Power In-Memory Computing Platform Using Cotermious Spin Switch”. In: *IEEE Transactions on Magnetism* 54.7 (2018), pp. 1–14. [📄](#).
- [J17] Zhezhi He, Shaahin Angizi, and Deliang Fan. “Current -induced dynamics of multiple skyrmions with domain-wall pair and skyrmion-based majority gate design”. In: *IEEE Magnetism Letters* 8 (2017), pp. 1–5. [📄](#).
- [J18] Zhezhi He and Deliang Fan. “Energy efficient reconfigurable threshold logic circuit with spintronic devices”. In: *IEEE Transactions on Emerging Topics in Computing* 5.2 (2017), pp. 223–237. [📄](#).

CONFERENCE

- [C1] Chen Nie, Xianjue Cai, Chenyang Lv, Chen Huang, Weikang Qian, and Zhezhi He. “XMG-GPPIC: Efficient and Robust General-Purpose Processing-in-Cache with XOR-Majority-Graph”. In: *(GLSVLSI-23) Proceedings of the 2023 on Great Lakes Symposium on VLSI*. 2023.
- [C2] Tao Yang, Hui Ma, Yilong Zhao, Fangxin Liu, Zhezhi He, Xiaoli Sun, and Li Jiang. “PIMPR: PIM-based Personalized Recommendation with Heterogeneous Memory Hierarchy”. In: *2023 Design, Automation & Test in Europe Conference & Exhibition (DATE)*. IEEE. 2023, pp. 1–6.
- [C3] Yu Gong=, Zhihan Xu=, Zhezhi He*, Weifeng Zhang, Xiaobing Tu, Xiaoyao Liang, and Li Jiang*. “N³H-Core: Neuron-designed Neural Network Accelerator via FPGA-based Heterogeneous Computing Cores”. In: *Proceedings of the 2022 ACM/SIGDA International Symposium on Field-Programmable Gate Arrays (FPGA’22)*. 2022.
- [C4] Jingtao Li, Adnan Siraj Rakin, Xing Chen, Zhezhi He, Deliang Fan, and Chaitali Chakrabarti. “ResSFL: A Resistance Transfer Framework for Defending Model Inversion Attack in Split Federated Learning”. In: *(CVPR) IEEE/CVF Conference on Computer Vision and Pattern Recognition*. 2022.
- [C5] Fangxin Liu, Wenbo Zhao, Yongbiao Chen, Zongwu Wang, Zhezhi He, Rui Yang, Qidong Tang, Tao Yang, Cheng Zhuo, and Li Jiang. “PIM-DH: ReRAM-based processing-in-memory architecture for deep hashing acceleration”. In: *Proceedings of the 59th ACM/IEEE Design Automation Conference (DAC-22)*. 2022, pp. 1087–1092.

- [C6] Fangxin Liu, Wenbo Zhao, Zongwu Wang, Yongbiao Chen, Zhezhi He, Naifeng Jing, Xiaoyao Liang, and Li Jiang. “EBSP: evolving bit sparsity patterns for hardware-friendly inference of quantized deep neural networks”. In: *Proceedings of the 59th ACM/IEEE Design Automation Conference (DAC-22)*. 2022, pp. 259–264.
- [C7] Fangxin Liu, Wenbo Zhao, Zongwu Wang, Yongbiao Chen, Tao Yang, Zhezhi He, Xiaokang Yang, and Li Jiang. “SATO: spiking neural network acceleration via temporal-oriented dataflow and architecture”. In: *Proceedings of the 59th ACM/IEEE Design Automation Conference (DAC-22)*. 2022, pp. 1105–1110.
- [C8] Chen Nie, Zongwu Wang, Qidong Tang, Chenyang Lv, Li Jiang, and Zhezhi He. “Cross-layer Designs against Non-ideal Effects in ReRAM-based Processing-in-Memory System”. In: *2022 23rd International Symposium on Quality Electronic Design (ISQED)*. IEEE. 2022, pp. 1–6.
- [C9] Qidong Tang, Zhezhi He*, Fangxin Liu, Zongwu Wang, yiyuan Zhou, Yinghuan Zhang, and Li Jiang. “HAWIS: Hardware-Aware Automated Width Search for Accurate, Energy-Efficient and Robust Binary Neural Network on ReRAM Dot-Product Engine”. In: *The 27th Asia and South Pacific Design Automation Conference (ASP-DAC 2022)*. 2022.
- [C10] Zongwu Wang, Zhezhi He*, Rui Yang, Shiquan Fan, Jie Lin, Yueyang Jia, Chenxi Yuan, Qidong Tang, and Li Jiang*. “Self-Terminating Writing of Multi-Level Cell ReRAM for Efficient Neuromorphic Computing”. In: *Proceedings of IEEE Design, Automation and Test in Europe Conference (DATE’22)*. 2022. **Best Paper Award**.
- [C11] Tao Yang, Dongyue Li, Zhuoran Song, Yilong Zhao, Fangxin Liu, Zongwu Wang, Zhezhi He, and Li Jiang. “DTQAtten: Leveraging Dynamic Token-based Quantization for Efficient Attention Architecture”. In: *(DATE-22) 2022 Design, Automation & Test in Europe Conference & Exhibition*. IEEE. 2022, pp. 700–705.
- [C12] Dongyue Li, Tao Yang, Zhezhi He*, Lun Du, and Li Jiang. “AdaptiveGCN: Efficient GCN Through Adaptively Sparsifying Graphs”. In: *The Conference on Information and Knowledge Management (CIKM’21)*. 2021.
- [C13] Jingtao Li, Zhezhi He, Adnan Siraj Rakin, Deliang Fan, and Chaitali Chakrabarti. “NeuroObfuscator: A Full-stack Obfuscation Tool to Mitigate Neural Architecture Stealing”. In: *IEEE International Symposium on Hardware Oriented Security and Trust (HOST’21)*. 2021.
- [C14] Jingtao Li, Adnan Siraj Rakin, Zhezhi He, Deliang Fan, and Chaitali Chakrabarti. “RADAR: Run-time Adversarial Weight Attack Detection and Accuracy Recovery”. In: *Design, Automation and Test in Europe Conference (DATE’21)*. IEEE. 2021.
- [C15] Sen Lin, Li Yang, Zhezhi He, Deliang Fan, and Junshan Zhang. “MetaGater: Fast Learning of Conditional Channel Gated Networks via Federated Meta-Learning”. In: *IEEE 18th International Conference on Mobile Ad Hoc and Smart Systems (MASS’21)*. 2021.
- [C16] Fangxin Liu, Wenbo Zhao, Zhezhi He, Zongwu Wang, Yilong Zhao, Yongbiao Chen, and Li Jiang. “Bit-Transformer: Transforming Bit-level Sparsity into Higher Performance in ReRAM-based Accelerator”. In: *International Conference On Computer Aided Design (ICCAD’21)*. 2021.
- [C17] Fangxin Liu, Wenbo Zhao, Yilong Zhao, Zongwu Wang, Tao Yang, Zhezhi He, Naifeng Jing, Xiaoyao Liang, and Li Jiang. “SME: ReRAM-based Sparse-Multiplication-Engine to Squeeze-Out Bit Sparsity of Neural Network”. In: *IEEE International Conference on Computer Design (ICCD’21)*. 2021.
- [C18] Chen Nie, Jie Lin, Huan Hu, Li Jiang, Xiaoyao Liang, and Zhezhi He*. “Energy-Efficient Hybrid-RAM with Hybrid Bit-Serial based VMM Support”. In: *Proceedings of the 2021 on Great Lakes Symposium on VLSI*. ACM. 2021, pp. 347–352.
- [C19] Tianhong Shen, Yanan Sun, Weifeng He, Zhi Li, Weiyi Liu, Zhezhi He, and Li Jiang. “A Ternary Memristive Logic-in-Memory Design for Fast Data Scan”. In: *2021 IEEE International Conference on Integrated Circuits, Technologies and Applications (ICTA)*. IEEE. 2021, pp. 183–184.

- [C20] Zhuoran Song, Dongyue Li, [Zhezhi He](#), Xiaoyao Liang, and Li Jiang. “ReRAM-Sharing: Fine-Grained Weight Sharing for ReRAM-Based Deep Neural Network Accelerator”. In: *2021 IEEE International Symposium on Circuits and Systems (ISCAS)*. IEEE. 2021, pp. 1–5.
- [C21] Li Yang, [Zhezhi He](#), Junshan Zhang, and Deliang Fan. “KSM: Fast Multiple Task Adaption via Kernel-wise Soft Mask Learning”. In: *Conference on Computer Vision and Pattern Recognition (CVPR’21)*. IEEE. 2021.
- [C22] Tao Yang, Dongyue Li, Yibo Han, Yilong Zhao, Fangxin Liu, Xiaoyao Liang, [Zhezhi He](#), and Li Jiang. “PIMGCN: A ReRAM-based PIM Design for Graph Convolutional Network Acceleration”. In: *Design Automation Conference (DAC’21)*. ACM. 2021.
- [C23] Wuyang Zhang, [Zhezhi He](#), Luyang Liu, Zhenhua Jia, Yunxin Liu, Marco Gruteser, Dipankar Raychaudhuri, and Yanyong Zhang. “Elf: Accelerate High-resolution Mobile Deep Vision with Content-aware Parallel Offloading”. In: *27th Annual International Conference on Mobile Computing and Networking (MobiCom’21)*. ACM. 2021. (Accepted).
- [C24] Yilong Zhao, [Zhezhi He](#), Naifeng Jing, Xiaoyao Liang, and Li Jiang. “Re2PIM: A Reconfigurable ReRAM-Based PIM Design for Variable-Sized Vector-Matrix Multiplication”. In: *Proceedings of the 2021 on Great Lakes Symposium on VLSI*. ACM. 2021, pp. 15–20.
- [C25] [Zhezhi He](#), Adnan Siraj Rakin, Jingtao Li, Chaitali Chakrabarti, and Deliang Fan. “Defending and Harnessing the Bit-Flip based Adversarial Weight Attack”. In: *Conference on Computer Vision and Pattern Recognition (CVPR) (2020)*.  .
- [C26] Jingtao Li, Adnan Siraj Rakin, Yan Xiong, Liangliang Chang, [Zhezhi He](#), Deliang Fan, and Chaitali Chakrabarti. “Defending Bit-Flip Attack through DNN Weight Reconstruction”. In: *57th Design Automation Conference (DAC) (2020)*. (Accepted).
- [C27] Adnan Siraj Rakin, [Zhezhi He](#), and Deliang Fan. “TBT: Targeted Neural Network Attack with Bit Trojan”. In: *Conference on Computer Vision and Pattern Recognition (CVPR) (2020)*.  .
- [C28] Adnan Siraj Rakin, [Zhezhi He](#), Yanzhi Wang, Liqiang Wang, and Deliang Fan. “Robust Sparse Regularization: Adversarial Defense with Sparsity and Compactness”. In: *ACM Great Lakes Symposium on VLSI (GLSVLSI) (2020)*.
- [C29] Li Yang, [Zhezhi He](#), Shaahin Angizi, and Deliang Fan. “Processing-In-Memory Accelerator for Dynamic Neural Network with Run-Time Tuning of Accuracy, Power and Latency”. In: *33rd IEEE International System-on-Chip Conference (SOCC)*. IEEE. 2020. (Accepted).
- [C30] Li Yang, [Zhezhi He](#), and Deliang Fan. “Harmonious Coexistence of Structured Weight Pruning and Ternarization for Deep Neural Networks”. In: *Thirty-third AAAI Conference on Artificial Intelligence (AAAI) (2020)*. (**Spotlight**) .
- [C31] Li Yang, [Zhezhi He](#), and Deliang Fan. “Non-uniform DNN Structured Subnets Sampling for Dynamic Inference”. In: *57th Design Automation Conference (DAC) (2020)*. (Accepted).
- [C32] Shaahin Angizi, [Zhezhi He](#), and Deliang Fan. “ParaPIM: a parallel processing-in-memory accelerator for binary-weight deep neural networks”. In: *Proceedings of the 24th Asia and South Pacific Design Automation Conference (ASP-DAC)*. ACM. 2019, pp. 127–132. .
- [C33] Shaahin Angizi, [Zhezhi He](#), Dayane Reis, Sharon Xiaobo Hu, Wilman Tsai, Shy Jay Lin, and Deliang Fan. “Accelerating Deep Neural Networks in Processing-in-Memory Platforms: Analog or Digital Approach?” In: *2019 IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*. 2019, pp. 197–202. .
- [C34] Durjoy Dev, Adithi Krishnaprasad, [Zhezhi He](#), Sonali Das, Mashiyat Sumaiya Shawkat, Madison Manley, Olaleye Aina, Deliang Fan, Yeonwoong Jung, and Tania Roy. “Artificial Neuron using Ag/2D-MoS₂/Au Threshold Switching Memristor”. In: *2019 Device Research Conference (DRC)*. IEEE. 2019, pp. 193–194.
- [C35] [Zhezhi He](#) and Deliang Fan. “Simultaneously Optimizing Weight and Quantizer of Ternary Neural Network using Truncated Gaussian Approximation”. In: *Conference on Computer Vision and Pattern Recognition (CVPR) (2019)*. .

- [C36] Zhezhi He, Boqing Gong, and Deliang Fan. “Optimize Deep Convolutional Neural Network with Ternarized Weights and High Accuracy”. In: *IEEE Winter Conference on Applications of Computer Vision (WACV)* (2019).  .
- [C37] Zhezhi He, Jie Lin, Rickard Ewetz, Jiann-Shiun Yuan, and Deliang Fan. “Noise Injection Adaption: End-to-End ReRAM Crossbar Non-ideal Effect Adaption for Neural Network Mapping”. In: *56-th Design Automation Conference (DAC)* (2019).  .
- [C38] Zhezhi He, Adnan Siraj Rakin, and Deliang Fan. “Bit-Flip Attack: Crushing Neural Network with Progressive Bit Search”. In: *International Conference on Computer Vision (ICCV)*. 2019.  .
- [C39] Zhezhi He, Adnan Siraj Rakin, and Deliang Fan. “Parametric Noise Injection: Trainable Randomness to Improve Deep Neural Network Robustness against Adversarial Attack”. In: *Conference on Computer Vision and Pattern (CVPR)* (2019).  .
- [C40] Li Yang, Zhezhi He, and Deliang Fan. “Binarized Depthwise Separable Neural Network for Object Tracking in FPGA”. In: *Great Lakes Symposium on VLSI (GLVLSI)* (2019). .
- [C41] Shaahin Angizi, Zhezhi He, Yu Bai, Jie Han, Mingjie Lin, Ronald F DeMara, and Deliang Fan. “Leveraging Spintronic Devices for Efficient Approximate Logic and Stochastic Neural Networks”. In: *Proceedings of the 2018 on Great Lakes Symposium on VLSI*. ACM. 2018, pp. 397–402. .
- [C42] Shaahin Angizi, Zhezhi He, and Deliang Fan. “DIMA: a depthwise CNN in-memory accelerator”. In: *2018 IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*. IEEE. 2018, pp. 1–8. .
- [C43] Shaahin Angizi, Zhezhi He, and Deliang Fan. “PIMA-logic: a novel processing-in-memory architecture for highly flexible and energy-efficient logic computation”. In: *Proceedings of the 55th Annual Design Automation Conference (DAC)*. ACM. 2018, p. 162. .
- [C44] Shaahin Angizi, Zhezhi He, Farhana Parveen, and Deliang Fan. “Imce: energy-efficient bit-wise in-memory convolution engine for deep neural network”. In: *Proceedings of the 23rd Asia and South Pacific Design Automation Conference*. IEEE Press. 2018, pp. 111–116. .
- [C45] Zhezhi He, Shaahin Angizi, and Deliang Fan. “Accelerating Low Bit-Width Deep Convolution Neural Network in MRAM”. In: *2018 IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*. IEEE. 2018, pp. 533–538. .
- [C46] Zhezhi He, Shaahin Angizi, Adnan Siraj Rakin, and Deliang Fan. “BD-NET: A Multiplication-Less DNN with Binarized Depthwise Separable Convolution”. In: *2018 IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*. IEEE. 2018, pp. 130–135. **Best Paper Award** .
- [C47] Zhezhi He, Shaahin Angizi, Adnan Siraj Rakin, and Deliang Fan. “CMP-PIM: an energy-efficient comparator-based processing-in-memory neural network accelerator”. In: *Proceedings of the 55th Annual Design Automation Conference (DAC)*. ACM. 2018, p. 105. .
- [C48] Farhana Parveen, Zhezhi He, Shaahin Angizi, and Deliang Fan. “HielM: Highly flexible in-memory computing using STT MRAM”. In: *2018 23rd Asia and South Pacific Design Automation Conference (ASP-DAC)*. IEEE. 2018, pp. 361–366. .
- [C49] Adnan Siraj Rakin, Shaahin Angizi, Zhezhi He, and Deliang Fan. “PIM-TGAN: A Processing-in-Memory Accelerator for Ternary Generative Adversarial Networks”. In: *2018 IEEE 36th International Conference on Computer Design (ICCD)*. IEEE. 2018, pp. 266–273. .
- [C50] Li Yang, Zhezhi He, and Deliang Fan. “A Fully Onchip Binarized Convolutional Neural Network FPGA Impelmentation with Accurate Inference”. In: *Proceedings of the International Symposium on Low Power Electronics and Design (ISLPED)*. ACM. 2018, p. 50. .
- [C51] Shaahin Angizi, Zhezhi He, Ronald F DeMara, and Deliang Fan. “Composite spintronic accuracy-configurable adder for low power digital signal processing”. In: *2017 18th International Symposium on Quality Electronic Design (ISQED)*. IEEE. 2017, pp. 391–396. .

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- [C54] Deliang Fan, Shaahin Angizi, and [Zhezhi He](#). “In-memory computing with spintronic devices”. In: *2017 IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*. IEEE. 2017, pp. 683–688. [📄](#).
- [C55] Deliang Fan, [Zhezhi He](#), and Shaahin Angizi. “Leveraging spintronic devices for ultra-low power in-memory computing: Logic and neural network”. In: *2017 IEEE 60th International Midwest Symposium on Circuits and Systems (MWSCAS)*. IEEE. 2017, pp. 1109–1112. [📄](#).
- [C56] [Zhezhi He](#), Shaahin Angizi, and Deliang Fan. “Exploring stt-mram based in-memory computing paradigm with application of image edge extraction”. In: *2017 IEEE International Conference on Computer Design (ICCD)*. IEEE. 2017, pp. 439–446. [📄](#).
- [C57] [Zhezhi He](#), Shaahin Angizi, Farhana Parveen, and Deliang Fan. “High performance and energy-efficient in-memory computing architecture based on sot-mram”. In: *2017 IEEE/ACM International Symposium on Nanoscale Architectures (NANOARCH)*. IEEE. 2017, pp. 97–102. [📄](#).
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- [C60] [Zhezhi He](#) and Deliang Fan. “Developing All-Skyrmion Spiking Neural Network”. In: *Neuromorphic Computing Symposium (NCS) (2017)*. [📄](#).
- [C61] Farhana Parveen, Shaahin Angizi, [Zhezhi He](#), and Deliang Fan. “Hybrid polymorphic logic gate using 6 terminal magnetic domain wall motion device”. In: *2017 IEEE International Symposium on Circuits and Systems (ISCAS)*. IEEE. 2017, pp. 1–4. [📄](#).
- [C62] Farhana Parveen, Shaahin Angizi, [Zhezhi He](#), and Deliang Fan. “Low power in-memory computing based on dual-mode SOT-MRAM”. In: *2017 IEEE/ACM International Symposium on Low Power Electronics and Design (ISLPED)*. IEEE. 2017, pp. 1–6. [📄](#).
- [C63] Farhana Parveen, [Zhezhi He](#), Shaahin Angizi, and Deliang Fan. “Hybrid polymorphic logic gate with 5-terminal magnetic domain wall motion device”. In: *2017 IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*. IEEE. 2017, pp. 152–157. **Best Paper Award** [📄](#).
- [C64] [Zhezhi He](#) and Deliang Fan. “A Low Power Current-mode Flash ADC with Spin Hall Effect Based Multi-threshold Comparator”. In: *Proceedings of the 2016 International Symposium on Low Power Electronics and Design*. ACM. 2016, pp. 314–319. [📄](#).

UNDER-REVIEW OR ARCHIVED

- [UA1] Li Yang, [Zhezhi He](#), Yu Cao, and Deliang Fan. “A Progressive Sub-Network Searching Framework for Dynamic Inference”. In: *arXiv preprint arXiv:2009.05681* (2020).
- [UA2] Adnan Siraj Rakin, [Zhezhi He](#), Boqing Gong, and Deliang Fan. “Robust Pre-Processing: A Robust Defense Method Against Adversary Attack”. In: *arXiv preprint arXiv:1802.01549* (2018).

TALK

- [T1] *Advance and Challenge of PIM to Accelerate Data Intensive Applications*. ChinaDA. Virtual Conference, China, Jan. 2021.
- [T2] *Application of Emerging Device in Neuromorphic Computing*. Academic Forum, Institute of Medical Robotics, Shanghai Jiao Tong University. Shanghai, China, Dec. 2020.
- [T3] *Secure and Efficient AI Computing System: A Software and Hardware Co-design Perspective*. University of Illinois at Chicago. Chicago, Illinois, USA, Mar. 2020.
- [T4] *Secure and Efficient AI Computing System: A Software and Hardware Co-design Perspective*. Binghamton University. Binghamton, New York, USA, Mar. 2020.
- [T5] *Secure and Efficient AI Computing System: A Software and Hardware Co-design Perspective*. University of Central Florida. Orlando, Florida, USA, Mar. 2020.
- [T6] *Secure and Efficient AI Computing System: A Software and Hardware Co-design Perspective*. University of Nevada, Reno. Reno, Nevada, USA, Mar. 2020.
- [T7] *Secure and Efficient AI Computing System: A Software and Hardware Co-design Perspective*. Shanghai Jiao Tong University. Shanghai, China, May 2020.
- [T8] *Noise Injection Adaption: End-to-End ReRAM Crossbar Non-ideal Effect Adaption for Neural Network Mapping*. 56-th Design Automation Conference (DAC). Las Vegas, NV, USA, June 2019.
- [T9] *High Performance and Energy-efficient In-memory Computing Architecture based on SOT-MRAM*. 2017 IEEEACM International Symposium on Nanoscale Architectures. Newport, Rhode Island, USA, July 2017.

POSTER

- [P1] *Design and Evaluation of in-Memory Processing Unit (MPU) for Data-Centric Computations*. Semiconductor Research Corporation TECHCON. Austin, TX, USA, Sept. 2019.
- [P2] *Parametric Noise Injection: Trainable Randomness to Improve Deep Neural Network Robustness against Adversarial Attack*. Conference on Computer Vision and Pattern Recognition (CVPR). Long Beach, CA, USA, June 2019.
- [P3] *Simultaneously Optimizing Weight and Quantizer of Ternary Neural Network using Truncated Gaussian Approximation*. Conference on Computer Vision and Pattern Recognition (CVPR). Long Beach, CA, USA, June 2019.

Teaching

2020-now	Shanghai Jiao Tong University CS427 Multicore Architecture and Parallel Processing CS179 Thinking and Methodology in Programming EAP Academic English
2016-2017	University of Central Florida EEL3801 Computer Organization and Design EGN3373 Introduction to Electrical System I EEE3342 Digital System: Lab instructor EEE4309 Electronics II: Lab instructor EEL4742 Embedded System: Lab instructor

Student Supervision

2020- Chen Nie, PhD program
2022- Kang You, PhD program
2023- Zekai Xu, PhD program
2021- Chenyu Tang, Master program
2021- Chenyang Lv, Master program
2022- Cheng Zou, Master program
2022- Boning Zhang, Master program
2023- Ziling Wei, Master program
2023- Junyan Lee, Master program

Service to the profession

JOURNAL SERVICE

2021 Guest editor of Applied Science
2022 Guest editor of Frontier in Electronics

CONFERENCE SERVICE

2022 Session chair of 41th edition of IEEE/ACM International Conference On Computer Aided Design (ICCAD)
2021 Publication chair of International Test Conference in Asia (ITC-Asia)

TECHNICAL PROGRAM COMMITTEE MEMBER

2023 42th edition of IEEE/ACM International Conference On Computer Aided Design (ICCAD)
2023 60th edition of I Design Automation Conference (DAC)
2022 41th edition of IEEE/ACM International Conference On Computer Aided Design (ICCAD)
2022 32th edition of the ACM Great Lakes Symposium on VLSI (GLSVLSI)
2022 59th edition of the Design Automation Conference (DAC)
2021 40th edition of the IEEE/ACM International Conference On Computer Aided Design (ICCAD)
2021 14th edition of the CCF International Symposium On Advanced Parallel Processing Technology (APPT)
2021 31th edition of the ACM Great Lakes Symposium on VLSI (GLSVLSI)
2021 58th edition of the Design Automation Conference (DAC)
2020 30th edition of the ACM Great Lakes Symposium on VLSI (GLSVLSI)

JOURNAL REVIEW

2022 Reviewer of ACM Transactions on Design Automation of Electronic Systems (TODAES)
2022 Reviewer of IEEE Transactions on Image Processing (TIP)
2020 Reviewer of IEEE Transactions on Emerging Topics in Computing (TETC)
2020 Reviewer of IEEE Journal on Emerging and Selected Topics in Circuits and Systems (JETCAS)
2020 Reviewer of IEEE Transactions on Parallel and Distributed Systems (TPDS)
2020 Reviewer of IEEE Transactions on Neural Networks and Learning Systems (TNNLS)
2020 Reviewer of IEEE Transactions on Cloud Computing (TCC)
2020 Reviewer of IEEE Design & Test
2020 Reviewer of ELSEVIER Microprocessors and Microsystems
2020 Reviewer of CCF Transactions on High Performance Computing

2019 Reviewer of ELSEVIER Journal of Artificial Intelligence (AI)
 2019-2020 Reviewer of IEEE Transactions on Circuits and Systems I: Regular Papers (TCAS-I)
 2019 Reviewer of IOPscience Applied Physics Express
 2019 Reviewer of IEEE Transactions on Electron Devices (TED)
 2019 Reviewer of IEEE Access
 2018 Reviewer of Microelectronics Journal
 2017-2018 Reviewer of IEEE Transactions on Nanotechnology (TNANO)
 2017-2020 Reviewer of Integration, the VLSI Journal
 2016-2017 Reviewer of IEEE Transactions on Computers (TC)

CONFERENCE REVIEW

2021 Reviewer of International Conference on Computer Vision (ICCV)
 2020 Reviewer of IEEE/ACM International Symposium on Microarchitecture (MICRO)
 2020 Reviewer of Neural Information Processing Systems 2020 (NeurIPS)
 2020 Reviewer of European Conference on Computer Vision (ECCV)
 2020 Sub-reviewer of IEEE/ACM International Symposium on Low Power Electronics and Design (ISLPED)
 2020 Reviewer of Design, Automation and Test in Europe Conference (DATE)
 2020 Reviewer of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
 2020 Reviewer of IEEE International Symposium on High-Performance Computer Architecture (HPCA)
 2020-2021 Reviewer of IEEE Winter Conference on Application of Computer Vision (WACV)
 2018-2020 [Expert reviewer](#) of Design Automation Conference (DAC)
 2018-2019 Reviewer of International Conference On Computer Aided Design (ICCAD)
 2018-2019 Reviewer of ACM Great Lakes Symposium on VLSI (GLSVLSI)
 2019 Reviewer of International Symposium on Quality Electronic Design (ISQED)
 2018-2019 Reviewer of IEEE International Midwest Symposium on Circuits and Systems (MWSCAS)
 2018 Reviewer of IEEE Non-Volatile Memory Systems and Applications Symposium
 2017 Reviewer of IEEE Computer Society Annual Symposium on VLSI (ISVLSI)
 2017 Reviewer of Asia and South Pacific Design Automation Conference (ASP-DAC)

Courses

- Machine learning
- VLSI system design
- Analog CMOS integrated circuit
- Information theory
- Electric and magnetic fields
- Signals and systems
- Probability and random signals
- Computer architecture
- Linear system
- RF microwave circuit design

Skills

LANGUAGES

- English (professional-proficiency)
- Mandarin (native)

SCRIPTING

Machine Learning Framework (Pytorch, Torch, TensorFlow)
 Scientific programming (Python, MATLAB, C++/C)
 System language (Bash shell, Tcl/Tk)
 Hardware language (Verilog/VHDL, SPICE)
 Digital typesetting (Latex, Microsoft Word)

EDA TOOLS

- Cadence (IC)
- ADS (RF)
- Mentor Pads (PCB)
- Design-Compiler (VLSI)
- ISE design suit (FPGA)
- OOMMF (Magnetic)