

DAN WU

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📍 COM3-02-17, System and Networking Lab, 13 Computing Drive, Singapore 117417

EDUCATION

- **National University of Singapore, Singapore** Sept. 2020 - Present
Ph.D. in Computer Science. Advisor: Tulika Mitra
- **Fudan University, China** Jan. 2015 - Jun. 2020
B.Sc. in Computer Science.

RESEARCH INTERSETS

I have been working on reconfigurable architecture and compilation, Graph Neural Networks acceleration, and classic graph algorithm acceleration. I am also interested in other non-graph-based machine learning acceleration.

PUBLICATIONS

- [1] **InkStream: Real-time GNN Inference on Streaming Graphs via Incremental Update** In submission
Dan Wu, Zhaoying Li, and Tulika Mitra.
 - Designed an event-based method reducing irregular memory access and repeated computation of Graph Neural Network (GNN) inference on dynamic graphs by incrementally updating node embedding.
- [2] **Flip: Data-Centric Edge CGRA Accelerator** In submission
Dan Wu, Peng Chen, Thilini Kaushalya Bandara, Zhaoying Li, and Tulika Mitra.
 - Proposed a full-stack solution (compiler, simulator, and RTL implementation) for accelerating the irregular graph analysis algorithms on Coarse-Grained Reconfigurable Array (CGRA) originally designed for regular loop kernels.
- [3] **FLEX: Introducing FLEXible Execution on CGRA with Spatio-Temporal Vector Dataflow** ICCAD'23
Thilini Kaushalya Bandara, Dan Wu, Rohan Juneja, Dhananjaya Wijerathne, Tulika Mitra, and Li-Shiuan Peh.
 - Designed a CGRA with a novel, flexible spatio-temporal vector dataflow execution model, reaching a balance between energy-efficient low-throughput spatial CGRAs and energy-consuming high-throughput spatial-temporal CGRAs by adjusting the reconfiguration frequency.
- [4] **LISA: Graph Neural Network based Portable Mapping on Spatial Accelerators** HPCA'22
Zhaoying Li, Dan Wu, Dhananjaya Wijerathne, and Tulika Mitra. Distinguished Artifact Award
 - Proposed a portable compilation framework that can be tuned automatically to generate quality mapping for varied spatial accelerators.
- [5] **Mining verb-oriented commonsense knowledge** ICDE'20
Jingping Liu, Yuanfu Zhou, Dan Wu, Chao Wang, Haiyun Jiang, Sheng Zhang, Bo Xu, and Yanghua Xiao.
 - Proposed a knowledge-driven approach to mine verb-oriented commonsense knowledge from verb phrases with the help of taxonomy.

WORK EXPERIENCE

- **The Hong Kong Polytechnic University** Jul. 2019 - Dec. 2019
Research Assistant. Advisor: Jiannong Cao
 - Designed an estimation model to adaptively partition neural network models by layer and deploy different parts on different edge devices for model inference acceleration.

PRACTICAL EXPERIENCE

- **Integration of TVM and NVDLA** Sep. 2020 - Nov. 2020
 - Improved the performance and compatibility of the latest industrial accelerator NVDLA by allowing NVDLA compiler to use a highly optimized and frontend-friendly TVM model as input. Has 24 stars on GitHub.