DAN WU

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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 application acceleration, and Graph Neural Networks acceleration. I am also interested in other non graph-based machine learning acceleration, especially NeRF and diffusion model.

PUBLICATIONS

[1] **InkStream: Real-time GNN Inference on Streaming Graphs via Incremental Update.** **In submission**
Dan Wu, Zhaoying Li, and Tulika Mitra.

- Solves the challenge of tremendous irregular memory access of Graph Neural Network (GNN) inference on dynamic graphs by incrementally updating node embedding using an event-based method.

[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) original 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.

- Proposed a full-stack solution 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, Tulika Mitra *Distinguished Artifact Award*

- Proposed a general and fast method to data flow graph mapping problem on different CGRA designs by using GNNs to guide the mapping.

[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** *July 2019 - Dec 2019*
Research Assistant. *Advisor: Jiannong Cao*
- 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*
- Improve the performance and compatibility of the latest industrial accelerator NVDLA by allowing NVDLA compiler use highly optimized and frontend-friendly TVM model as input. 24 stars on GitHub.