YANG YANG

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EDUCATION

Jilin University, Changchun, China *Sept. 2019 – Jul. 2023*
B.S. in Computer Science and Technology
GPA: 3.69/4.0
Rank: 9%
Thesis: *The Design and Implementation of Binary Code Analysis Framework for NVIDIA GPU.* **[Score: 95/100]**
Advisor: Prof. Jingweijia Tan

University of Virginia, Charlottesville, USA *Aug. 2023 – Present*
Ph.D. in Computer Science
Interests: GPU · Storage · Energy-Efficiency · Security
Advisor: Prof. Adwait Jog

PUBLICATION

Facilitating Profile Guided Compiler Optimization with Machine Learning.
Yang Yang, Xueying Wang, Guangli Li*
SRC@CGO'23 [Poster]

- **Achieving an average of 1.03× and 1.95× speedups on representative real-world applications and *Polybench* benchmark suite over the baseline (i.e., the programs without PGO), respectively.**
- **The performance of our machine learning-aided PGO is very close to the classic PGO (1.05× and 1.97× speedups over the baseline) while reducing 58.3% and 94.8% optimization costs.**

RESEARCH EXPERIENCE

Insight Computer Architecture Lab *Aug. 2023 – Present*
University of Virginia, Charlottesville, Virginia, USA
Advisor: Prof. Adwait Jog
Research on: GPU Memory and Storage & GPU Security
What We Do:

- **Exploring the memory and storage system (e.g., direct GPU communication to NVMe SSDs).**
- **Exploring how to enable confidential computing on GPU and make it more secure and efficient.**
- **Exploiting the opportunities to utilize post-quantum cryptography (e.g. FHE, LWE) in GPUs and how to make them faster.**
- **Exploiting the feasibility for using CXL.**

Emerging Technology Enabled Computer Architecture Lab *Feb. 2022 – Jul. 2023*
Jilin University, Changchun, Jilin, P.R.China
Research Assistant, Advisor: Prof. Jingweijia Tan
Research on: GPU Architecture & Reliability & Energy Efficiency & Accelerator
What We Do:

- **Explored the process variation of MCM-GPUs based on FinFET and state-of-the-art chiplet technology.**
- **Exploited the potential of FPGA for building open-sourced GPU like Vortex.**
- **Implemented a Low-Level Analysis and Modeling framework for NVIDIA Ampere GPU.**
- **Applied deep learning techniques for accurate power modeling.**
- **Examined the power-level effect of the instruction control flag when generating the SASS.**

State Key Laboratory of Processor *Jul. 2022 – Sept. 2023*
Institute of Computing Technology, Chinese Academy of Science, Beijing, P.R.China
Research Assistant, Advisor: Prof. Guangli Li
Research on: Compiler & Programming Systems & Deep Learning
Project: Facilitating Profile-Guided Compiler Optimization with Graph Neural Networks

- **Proposed a branch predictor using XGBoost based on static features.**
- **Explore the speedup sensibility of different programs towards different feature design.**
- **Utilize GNNs to build predictive profile-guided optimization framework and integrated it into LLVM.**
- **Released a new dataset for graph-related static analysis tasks.**

TEACHING EXPERIENCE

24 Fall @ UVA, TA for CS: 6354 Computer Architecture

SKILLS

Languages	**C/C++ · Assembly · Python · Go**
Frameworks	**CUDA · Pytorch · LLVM**
Software	**LINUX · LaTeX · Markdown · GNU compiler (gcc, *etc.*) · GPGPU-Sim · Varius-TC · Z3 Solver**