

# NIANSONG ZHANG

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## EDUCATION

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### Cornell University

August 2021 - June 2023

M.S. in Computer Engineering, advised by Prof. Zhiru Zhang  
Department of Electric and Computer Engineering

### Sun Yat-sen University

August 2016 - June 2020

B.Eng. in Telecommunication Engineering  
School of Electornics and Information Technology

Outstanding Thesis, Overall GPA: 3.8/4

## WORK EXPERIENCE

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### Intel Labs

Feb 2021 – Aug 2021

*Exempt Technology Employee, Mentor: Dr. Jin Yang, Dr. Xu Zhang*     *SAVE Group, SCL/ADR/IL*

- Investigated and developed an ASIC backend (Cadence Stratus HLS) for HeteroCL.

### Tsinghua University

Nov 2019 – Aug 2021

*Research Intern, Advisor: Prof. Yu Wang*

*NICS-EFC Lab*

- DPU compiler, efficient network pruning, FPGA virtualization, 3D scene understanding.

### The University of Waterloo

Jul 2019 – Oct 2019

*Research Intern, Advisor: Prof. Nachiket Kapre*

*WatCAG Group*

- FPGA placement for large scale systolic arrays.

## PUBLICATIONS & MANUSCRIPTS

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- **Accelerator Design with Decoupled Hardware Customizations: Benefits and Challenges**  
★ **Invited Paper**  
Debjit Pal, Yi-Hsiang Lai, Shaojie Xiang, **Niansong Zhang**, Hongzheng Chen, Jeremy Casas, Pasquale Cocchini, Zhenkun Yang, Jin Yang, Louis-Nol Pouchet, Zhiru Zhang  
*ACM/IEEE Design Automation Conference (DAC), 2022*
- **Serving Multi-DNN Workloads on FPGAs: a Coordinated Architecture, Scheduling, and Mapping Perspective**  
Shulin Zeng, Guohao Dai, **Niansong Zhang**, Xinhao Yang, Haoyu Zhang, Zhenhua Zhu, Huazhong Yang, Yu Wang  
*IEEE/ACM Transactions on Computers (TC), 2022, Under Revision*
- **CodedVTR: Codebook-Based Sparse Voxel Transformer with Geometric Guidance**  
Tianchen Zhao, **Niansong Zhang**, Xuefei Ning, He Wang, Li Yi, Yu Wang  
*IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2022*
- **RapidLayout: Fast Hard Block Placement of FPGA-optimized Systolic Arrays using Evolutionary Algorithms**  
**Niansong Zhang**, Xiang Chen, Nachiket Kapre  
*ACM Transactions on Reconfigurable Technology and Systems (TRETS), November 2021*

- **HeteroFlow: An Accelerator Programming Model with Decoupled Data Placement for Software-Defined FPGAs**  
Shaojie Xiang, Yi-Hsiang Lai, Yuan Zhou, Hongzheng Chen, **Niansong Zhang**, Debjit Pal, and Zhiru Zhang.  
*ACM/SIGDA International Symposium on Field-Programmable Gate Arrays (FPGA)*, 2022.
- **RapidLayout: Fast Hard Block Placement of FPGA-optimized Systolic Arrays using Evolutionary Algorithms**  
★ **Best Paper Nominee**  
**Niansong Zhang**, Xiang Chen, Nachiket Kapre  
*International Conference on Field-Programmable Logic and Applications (FPL)*, 2020.
- **aw\_nas: A Modularized and Extensible NAS framework**  
Xuefei Ning, Changcheng Tang, Wenshuo Li, Songyi Yang, Tianchen Zhao, **Niansong Zhang**, Tianyi Lu, Shuang Liang, Huazhong Yang, Yu Wang  
Available on arXiv: [2012.10388](https://arxiv.org/abs/2012.10388).

## WORKSHOPS

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- **Enabling Fast Deployment and Efficient Scheduling for Multi-Node and Multi-Tenant DNN Accelerators in the Cloud**  
Shulin Zeng, Guohao Dai, **Niansong Zhang**, Yu Wang  
*IEEE/ACM International Symposium on Microarchitecture (MICRO) ASCMD Workshop*, 2021.

## PATENTS

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- **Niansong Zhang**, Tianyi Lu, Shuang Liang, *A Pruning Method and framework for Multi-task Neural Network Models*, Chinese Patent 202010805327.1, filed August 12, 2020.
- **Niansong Zhang**, Songyi Yang, Shun Fu, Xiang Chen, *An Automatic Geometric Dimension Measuring Method for Industrial Sheets Based on Computer Vision Techniques*, Chinese Patent CN201811539019.8A, filed December 17, 2018, and issued April 19, 2019.

## PROFESSIONAL SERVICES

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- Student Volunteer: [FCCM 2022](#).

## HONORS & AWARDS

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DAC Young Fellow	2021
FPL 2020 Best Paper Nomination (Michal Servit Award)	2020
Outstanding Bachelor Thesis Award	2020
Mitacs Canada Globalink Research Internship Award	2019
First-class Merit Scholarship (top 5%)	2018 & 2019
Lin and Liu Foundation Scholarship (2/172)	2017