WEI WEI

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RESEARCH INTERESTS

- Embedded Systems ● Edge Computing ● TinyML ● Internet of Things ● Energy Harvesting

EDUCATION

The University of Texas at San Antonio *2020 - Expected July 2026*
Doctor of Philosophy - Ph.D. Overall GPA: 4.0/4.0
Major: Computer Science

The University of Texas at San Antonio *2020 - 2024*
Master's Degree Overall GPA: 4.0/4.0
Major: Computer Science

The University of Texas at San Antonio *2015 - 2017*
Master's Degree Overall GPA: 4.0/4.0
Major: Computer Engineering

PUBLICATIONS AND MANUSCRIPTS

· Wei Wei, Mohammad Sadegh Sirjani, Mohammad Ahmad, Sahidul Islam, Chen Pan, and Mimi Xie. Model-aware ota update framework for tinyml on energy harvesting devices. In Preparation

· Mohammad Sadegh Sirjani, Mohammad Ahmad, Wei Wei, Pual Dutton, Dylan Yanez, Chen Pan, and Mimi Xie. Sparsebeat: Adaptive sparse sensing for ecg classification in intermittent energy-harvesting systems. In Preparation

· Wei Wei, Jingye Xu, Sahidul Islam, Chen Pan, Dakai Zhu, and Mimi Xie. Aero: Adaptive and efficient runtime-aware ota updates for energy-harvesting iot. In *Proceedings of the 2026 Design, Automation & Test in Europe Conference & Exhibition (DATE)*, 2026. Accepted

· Shyamala Palanisamy, Wei Wei, and Mimi Xie. Energy-efficient persistently secure block-based differential checkpointing for energy harvesting devices. In *Proceedings of the International Symposium on Quality Electronic Design (ISQED)*, 2025

· Sahidul Islam, Wei Wei, Jishnu Banerjee, and Chen Pan. Energy-adaptive checkpoint-free intermittent inference for low power energy harvesting systems. In *Proceedings of the International Symposium on Quality Electronic Design (ISQED)*, 2025

· Wei Wei, Jishnu Banerjee, Sahidul Islam, Chen Pan, and Mimi Xie. Energy-aware incremental ota update for flash-based batteryless iot devices. In *2024 IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, pages 51–56, 2024

· Wei Wei, Chen Pan, Sahidul Islam, Jishnu Banerjee, Shyamala Palanisamy, and Mimi Xie. Intermittent ota code update framework for tiny energy harvesting devices. *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, 2024

· Jishnu Banerjee, Sahidul Islam, Wei Wei, Chen Pan, and Mimi Xie. Autotile: Autonomous task-tiling for deep inference on battery-less embedded system. In *Proceedings of the Great Lakes Symposium on VLSI 2024*, pages 323–327, 2024

· Wei Wei, Sahidul Islam, Jishnu Banerjee, Shanglin Zhou, Chen Pan, Caiwen Ding, and Mimi Xie. An intermittent ota approach to update the dl weights on energy harvesting devices. In *2022 23rd International Symposium on Quality Electronic Design (ISQED)*, pages 1–6. IEEE, 2022

· Jiannan Cai, Xin Li, Xiaoyun Liang, Wei Wei, and Shuai Li. Construction worker ergonomic assessment via lstm-based multi-task learning framework. In *Construction Research Congress 2022*, pages 215–224, 2022
· Jishnu Banerjee, Sahidul Islam, Wei Wei, Chen Pan, Dakai Zhu, and Mimi Xie. Memory-aware efficient deep learning mechanism for iot devices. In *2021 IEEE 32nd International Conference on Application-specific Systems, Architectures and Processors (ASAP)*, pages 187–194. IEEE, 2021
· Wei Wei. A dynamic iq-capping technique for simultaneous multi-threading processors. Master's thesis, The University of Texas at San Antonio, 2017

RESEARCH PROJECTS

Over-the-air Update for EH IoT Devices (ISQED'22, ISVLSI'24, TCAD)   Jan 2021-Present

· Developing a dynamic dependency-aware live OTA update framework for EH IoT devices that integrates update tasks into the runtime task graph without reboot or task preemption, using dependency analysis and unified scheduling to improve update efficiency and system reliability (Ongoing).
· Designed a general intermittent OTA code update framework with intermittent-aware update operations, update checkpointing, and bootloader support to enable energy-efficient firmware updates on EH IoT devices (TCAD).
· Proposed an energy-aware incremental OTA update scheme for flash-based EH IoT devices, reducing energy use and update latency through memory segment-based update packets (ISVLSI'24).
· Developed an intermittent OTA method for updating deep learning weights on EH IoT devices, enabling energy-efficient TinyML model adaptation during intermittent power cycles (ISQED'22).

Checkpointing for EH IoT Devices (ISQED'25)   Nov 2023-Apr 2025

· Developed a checkpoint-free intermittent inference framework for EH IoT devices that reduces DNN model complexity under limited energy, maintaining progress and consistency during power failures while avoiding the errors and latency of traditional checkpoint-and-restore methods. (ISQED'25)
· Designed an energy-efficient block-based differential checkpointing framework for EH IoT devices that encrypts modified memory blocks, providing persistently secure checkpoints across power failures while reducing storage and energy overhead. (ISQED'25)

Intermittent Inference for EH IoT Devices (ASAP'21, GLSVLSI'24)   Dec 2020-Jun 2024

· Proposed Autotile, an environmentally adaptive dynamic DNN tiling method for EH IoT devices that partitions input data into smaller tiles and adjusts tile sizes based on available energy, improving energy efficiency and runtime reliability under intermittent power conditions compared to state-of-the-art methods.(GLSVLSI'24)
· Introduced memory-aware deep learning mechanisms that maximize the use of high-speed volatile memory and reduce costly data movement between volatile and non-volatile memory, providing multiple implementation choices to minimize energy, latency, and memory footprint for efficient deep learning deployment on EH IoT devices (ASAP'21).

TEACHING EXPERIENCE

Instructor   The University of Texas at San Antonio

· CS 2123 Data Structures – Java (scheduled for Spring 2026)

Teaching Assistant   The University of Texas at San Antonio

· CS 5523 Operating Systems (Spring 2022, Fall 2022, Spring 2023, Spring 2024)
    Occasionally substituted as the instructor
· CS 2233 Discrete Math Structures (Summer 2022)
· CS 3853 Computer Architecture (Summer 2023)
· CS 5233 Artificial Intelligence (Fall 2023)

- CS 4473/5723 Cryptocurrencies and Bitcoins (Fall 2023)

AWARDS

- Received the Graduate School Professional Development Travel Award from The University of Texas at San Antonio (2024).
- Received NSF ISVLSI Student Travel Grant Award (2024).
- Winner of the 2-Minute Video Contest at the 59th Design Automation Conference (DAC) Young Fellow Program (2022).
- Young Fellow Program at the 59th Design Automation Conference (DAC) (2022).
- Received the Graduate School Professional Development Travel Award from The University of Texas at San Antonio (2022).
- Young Fellow Program at the 58th Design Automation Conference (DAC) (2021).
- Received Pioneer Scholarship from The University of Texas at San Antonio (2016).
- Received Competitive Valero Research Scholarships from The University of Texas at San Antonio (2015).

WORK EXPERIENCE

The University of Texas at San Antonio   San Antonio, TX
Graduate Research/Teaching Assistant   *Sep 2020-Present*

- Conducting research on optimizing over-the-air update efficiency for energy harvesting IoT devices.
- Collaborating on strategies to enhance intermittent deep learning and intermittent computing performance.

Leaptran   San Antonio, TX
Software Development Engineer   *Jul 2017-Jul 2020*

- Designed and implemented an energy-efficient building management system for commercial buildings.
- Developed a scalable RESTful API using PHP and the Lumen framework.
- Conducted data preprocessing with SQL and Python for analysis.
- Managed client data using MySQL and Grafana for information retrieval and decision-making.

Leaptran   San Antonio, TX
Software Development Engineer Intern   *Mar 2017-Jun 2017*

- Researched technologies for recording occupant behavior and HVAC control systems in commercial and residential buildings.
- Designed and implemented Python modules to store data in PostgreSQL and control devices via REST APIs for occupant behavior and HVAC system studies.

The University of Texas at San Antonio   San Antonio, TX
Graduate Research Assistant   *Jan 2016-May 2017*

- Conducted research in computer architecture, developing a dynamic IQ-capping technique to enhance Instructions Per Cycle (IPC) for simultaneous multi-threading processors using the C++ M-Sim simulator.

SKILLS

Programming Skills:
C++, C, C#, Python, PHP, Assembly, SQL

Other Technical Skills:
Embedded Systems, REST API, Machine Learning, Deep Learning, MySQL, PostgreSQL, MQTT, Modbus,

BACnet, TCP/IP, Git, JSON, Linux

Languages:
English, Chinese

PROFESSIONAL ACTIVITIES

- · Student Member, Institute of Electrical and Electronics Engineers (IEEE).
- · Reviewer for IEEE Computer Society Annual Symposium on VLSI (ISVLSI) 2025; reviewed 3 papers.
- · Reviewer for IEEE Cloud Summit (Cloud Summit) 2025; reviewed 2 papers.
- · Reviewer for The Journal of Supercomputing 2025; reviewed 2 papers.
- · Reviewer for the 40th ACM/SIGAPP Symposium on Applied Computing (SAC) 2025; reviewed 2 papers.
- · Reviewer for the 9th ACM/IEEE Conference on Internet of Things Design and Implementation (IoTDI) 2024; reviewed 1 paper.
- · Participated in the 12th International Green and Sustainable Computing Conference (IGSC) Student Research Forum (2021).