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SUMMARY

Passionate PhD candidate in Computer Science with extensive experience in High-Performance Computing (HPC) resilience analysis and innovative code intelligence on LLM techniques. Proven track record in developing cutting-edge tools, teaching, and conducting collaborative research. Seeking a research role in HPC applications and systems, compilers, or generative AI systems starting May 2025.



Ph.D. in Computer Science

August 2018 to December 2024 (Expected)

- Kent State University, Kent, OH
- Dissertation: "Research on resilience in high-performance Computing (HPC) applications with Large Language Models"

M.S. in IC Engineering

August 2014 to May 2017

- University of Chinese Academy of Science, Beijing, China
- Thesis: "The Study of Cu2ZnSnS4 films generation by sulfur-free annealing process and device application"

B.S. in Electronic Science and technology

August 2010 to June 2014

February 2023 to August 2023 Advisor: Dr. Michael Kruse

- Xidian University, Xi'an, China
- Thesis: "A novel infrared object tracking algorithm"

EMPLOYMENT

Argonne National Lab

Mathematics Computer Science Division

Job Title: Research Aide Technical

Research topic: translation between parallelization languages

- Complete the metadata process in the project "EXCELLENT" which translates parallelization language to each other in the compilation,
- Engineering in a combination of Noelle and SPLENDID
- Setup experiment environment for OpenMP/CUDA decompilation

Kent State University

Department of Computer Science

Job Title: Research Assistant

Research topic: IR representation for LLMs on Program analysis

- Develop a novel IR representation method
- Study the LLM and IR combination

August 2023 to present **Advisor: Dr. Qiang Guan**

Kent State University

August 2018 to December 2023

Advisor: Dr. Qiang Guan

Department of Computer Science

Job Title: Research Assistant

Research topic: Program resilience analysis on High-performance computing (HPC) systems

- Built a soft error simulation platform on <u>LLVM</u>
- Developed a resilience analysis platform with <u>transformer/LLM</u>
- Improved the resilience prediction accuracy by 30%
- Built a visualization framework to study error propagation using the control-flow graph

Kent State University

May 2022 to August 2022

Advisor: Dr. Robert J. Clements

Biology Department

Job Title: Summer Internship

- Developed TIE algorithm plugin based on ImageJ and FIJI
- Developed ImageJ plug-in to process biological images

Los Alamos National Lab

May 2019 to August 2019

High-Performance Computing Division

Advisor: Dr. Nathan DeBardeleben

Job Title: Summer Internship

- Developed FI-VIS tool based on Pin and Pinfi
- Trace and visualize error propagation in program execution at the instruction level.

-`@: ™ TEACHING

Cloud Computing (Under/graduate)	Fall 2020
Lecture Instructor	
Computer Organization (Undergraduate)	Fall 2022
Lecture Instructor	
Advanced Digital Design (Under/graduate)	Fall 2021
Lecture Instructor	
Operating System (Under/graduate)	Spring 2021

Teaching Assistant

Spring 20.



RESEARCH TOPICS:

- IR representation for LLMs [0]
- Resilience Analysis of High-performance Computing System [1-5]
- Implementation and Interpretation of Large Language Model on Code/NLP Analysis [0, 6]
- Robustness enhancement of Machine Learning models [7-11]

PUBLICATIONS:

0. Can Large Language Models Understand IRs?

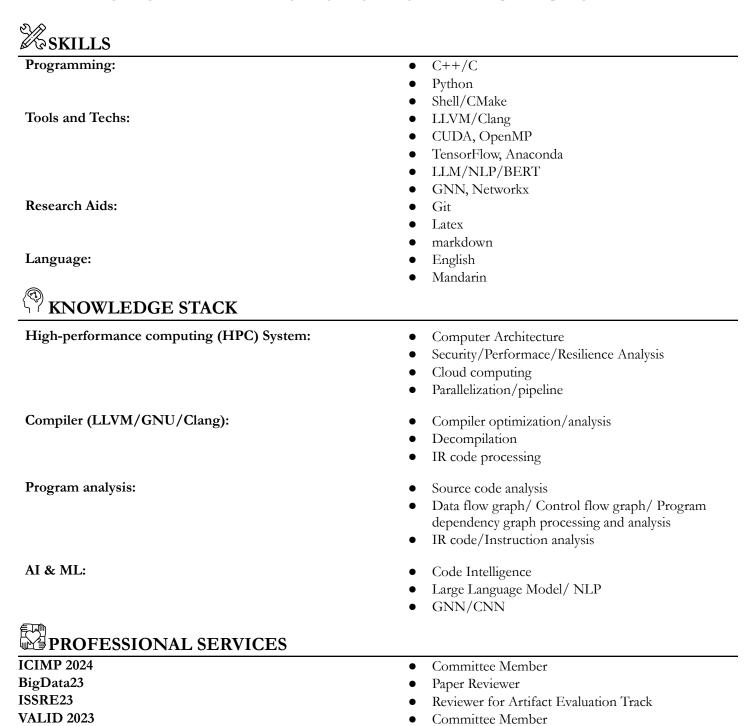
Hailong Jiang, Jianfeng Zhu, Ruoming Jin, Qiang Guan (Preprinted, Submitted to 2025 International Conference on Machine Learning (ICML'25))

- 1. Investigating Resilience of Loops in HPC Programs: A Semantic Approach with LLMs Hailong Jiang, Jianfeng Zhu, Bo Fang, Qiang Guan. 28th Annual IEEE High-Performance Extreme Computing Conference, 2024 (HPEC'24)
- 2. HAPAA: Resilience Prediction for HPC Applications Using Transformer with Chunking and Aggregation Hailong Jiang, Jianfeng Zhu, Qiang Guan. 43rd International Symposium on Reliable Distributed Systems (SRDS 2024)
- 3. VISILIENCE: An Interactive Visualization Framework for Resilience Analysis using Control-Flow Graph Hailong Jiang, Shaolun Ruan, Bo Fang, Qiang Guan. 2023 IEEE 28th Pacific Rim International Symposium on Dependable Computing (PRDC 2023)
- 4. BatchLens: A Visualization Approach for Analyzing Batch Jobs in Cloud Computing Shaolun Ruan, Yong Wang, Hailong Jiang, Weijia Xu, Qiang Guan . 2022 Design, Automation & Test in Europe Conference & Exhibition (DATE), 108-111
- 5. Chaser: An Enhanced Fault Injection tool for tracing Soft Errors in MPI Applications Qiang Guan*, Xunchao Hu, Terence Grove, Bo Fang, Hailong Jiang, Heng Yin, Nathan DeBardeleben. 2020 50th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)
- 6. ResilienceVis: A Control-Flow Graph-based Visualization Framework for Resilience Analysis Hailong Jiang, Qiang Guan, Bo Fang, Shaolun Ruan, Sriram Krishnamoorthy, and Nathan DeBardeleben. SELSE 2021
- 7. Exploring the Digital Landscape of Antidepressant Use: Demographic Insights, Emotional Analysis, and **Topic Modeling** Zhu J, Zhang X, Jin R, Jiang H, Kenne DR. JMIR Preprints. 28/05/2024:62680 DOI: 10.2196/preprints.62680
- Robust feature modeling for face authentication in smart device A Li, X Liu, H Jiang. IEEE INFOCOM 2019-IEEE Conference on Computer Communications Workshops Jianfeng Zhu, Xinyu Zhang, Ruoming Jin, Hailong Jiang, Deric R Kenne Submitted to: Journal of Medical Internet Research
- 9. Semi-supervised subspace learning for pattern classification via robust low-rank constraint A Li, R An, D Chen, G Sun, X Liu, Q Wu, H Jiang. Mobile Networks and Applications 25, 2258-2269
- 10. Cross-view feature learning via structures unlocking based on robust low-rank constraint A Li, Y Ding, D Chen, G Sun, H Jiang, Q Wu. IEEE Access 8, 46851-46860
- 11. Elastic Network-based Subspace Clustering for security Authentication A Li, X Liu, H Jiang. 2019 Computing, Communications and IoT Applications (ComComAp), 226-230
- 12. Subspace structural constraint-based discriminative feature learning via nonnegative low-rank representation A Li, X Liu, Y Wang, D Chen, K Lin, G Sun, H Jiang. PloS one 14 (5), e0215450
- 13. Numerical simulation and experimental validation of inverted planar perovskite solar cells based on NiOx hole transport layer
 - X Wei, X Wang, H Jiang, Y Huang, A Han, Q Gao, J Bian, Z Liu. Superlattices and Microstructures 112, 383-393
- 14. Achieving composition-controlled Cu2ZnSnS4 films by a sulfur-free annealing process H Jiang, X Wei, Y Huang, X Wang, A Han, X Liu, Z Liu, F Meng, Japanese Journal of Applied Physics 56 (6), 065502
- 15. Liquid-based growth of polymeric carbon nitride films and their extraordinary photo electrocatalytic activity X Wei, **H Jiang**, Z Liu. RSC advances 6 (84), 81372-81377

POSTERS:

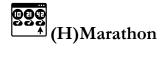
MONE22

- 1. Study on Resilience of HPC Applications with LLMs Hilong Jiang. 2024 Super Computing (SC24) Doctoral Showcase
- Visual Analysis on The Resilience of HPC Applications Using Control-Flow Graph Hailong Jiang, Shaolun Ruan, Bo Fang, Yong Wang, Qiang Guan. 2022 Super Computing (SC22) Poster

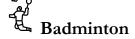


Committee Member











REFERENCE

Dr. Qiang Guan	Kent State University	
(Ph. D. Advisor)	Department of Computer Science	qguan@kent.edu 330.672.2191
Dr. Xiang Lian	Kent State University	
(Ph. D. Committee Member)	Department of Computer Science	xlian@kent.edu 330-672-9063
Dr. Bo Fang (Project Collaborator)	Pacific Northwest National Lab Scalable and Emerging Technology Group	bo.fang@pnnl.gov
Dr. Chao Chen (Project Collaborator)	Intel Corporation Compiler and Computing System Researcher	chao.chen@intel.com



Graduate Student Travel Awards

Kent State University (2024)