Jongouk Choi

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Academic Appointment

Assistant Professor — **University of Central Florida**
Department of Computer Science — *Aug. 2022 - present*

Education

Purdue University — **Aug. 2022**
Ph.D. in Computer Science — *West Lafayette, IN*

Kentucky State University — **Aug. 2017**
M.S in Computer Science — *Frankfort, KY*

Kentucky State University — **May. 2016**
B.S in Computer Science — *Frankfort, KY*

Publications ([top-tier] tag is used to mark the paper that appears in conferences selected by csrankings.org.)

In the following, the authors with asterisk annotation (*) are my students.

Compiler-Directed Page Coloring for Secure NVM in Energy Harvesting Systems
Junyeong Park*, Nicholas N'Heureux*, Hyunwoo Joe, Changhee Jung, Yan Solihin, and Jongouk Choi
[Abstract] ACM SIGBED Student Research Competition, Raleigh, NC, Oct. 2024

A Novel Efficient Crash Consistency Solution Enabling Rollback Recovery for Secure NVM in Low-power Energy Harvesting Systems
Youngkwang Han, Zhenyu Hu*, Jongouk Choi, Kazi Zubair, Amro Awad, Changhee Jung, and Brent ByungHoon Kang
IEEE Transactions on Dependable and Secure Computing 2024

[top-tier] Defending Against EMI Attacks on Just-In-Time Checkpoint for Resilient Intermittent Systems
Jaeseok Choi*, Hyunwoo Joe, Changhee Jung, and Jongouk Choi
the 57th IEEE/ACM International Symposium on Microarchitecture (MICRO), Austin, TX, Nov. 2024

[top-tier] Caphammer: Exploiting Capacitor Vulnerability of Energy Harvesting Systems
Jongouk Choi, Jaeseok Choi*, Hyunwoo Joe, and Changhee Jung
ACM SIGBED International Conference on Embedded Software (EMSOFT) published by IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), Raleigh, NC, Oct. 2024

[top-tier] Hybrid Power Failure Recovery for Intermittent Computing
Gan Fang, Jongouk Choi, and Changhee Jung
ACM/IEEE International Conference on Computer-Aided Design (ICCAD), Newark, NJ, Oct. 2024

SweepCache: A Compiler/Architecture Co-Design for Equipping Intermittent Computation with a Volatile Cache
Yuchen Zhou, Jianping Zeng, Jungi Jeong, Jongouk Choi, and Changhee Jung
15th Annual Non-Volatile Memories Workshop (NVMW'24), San Diego, March 2023

Write-Light Cache for Energy Harvesting Systems
Jongouk Choi, Jianping Zeng, Dongyoon Lee, Changwoo Min, and Changhee Jung
15th Annual Non-Volatile Memories Workshop (NVMW'24), San Diego, March 2023

[top-tier] SweepCache: A Compiler/Architecture Co-Design for Equipping Intermittent Computation with a Volatile Cache
Yuchen Zhou, Jianping Zeng, Jungi Jeong, Jongouk Choi, and Changhee Jung
56th IEEE/ACM International Symposium on Microarchitecture (MICRO'23), Toronto, Canada, October 2023

[top-tier] Write-Light Cache for Energy Harvesting Systems
Jongouk Choi, Jianping Zeng, Dongyoon Lee, Changwoo Min, and Changhee Jung
50th ACM/IEEE International Symposium on Computer Architecture (ISCA'23), Orlando, June, 2023

Compiler-Directed High-Performance Intermittent Computation with Power Failure Immunity
Jongouk Choi, Larry Kittinger, Qingrui Liu, and Changhee Jung
14th Annual Non-Volatile Memories Workshop (NVMW'23), San Diego, March 2023

CapOS: Capacitor Error Resilience for Energy Harvesting Systems
Jongouk Choi, Hyunwoo Joe, and Changhee Jung
14th Annual Non-Volatile Memories Workshop (NVMW'23), San Diego, March 2023

[top-tier] CapOS: Capacitor Error Resilience for Energy Harvesting Systems
Jongouk Choi, Hyunwoo Joe, and Changhee Jung
International Conference on Embedded Software (EMSOFT'22) published by IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), Virtual-Shanghai, Oct 2022

ReplayCache: Enabling Volatile Caches for Energy Harvesting Systems
Jianping Zeng, Jongouk Choi, Xinwei Fu, Ajay P. Shreepathi, Dongyoon Lee, Changwoo Min, and Changhee Jung
13th Annual Non-Volatile Memories Workshop (NVMW'22), Virtual, June 2021

[top-tier] Compiler-Directed High-Performance Intermittent Computation with Power Failure Immunity
Jongouk Choi, Larry Kittinger, Qingrui Liu, and Changhee Jung
28th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS'22), Virtual, May 2022

[top-tier] ReplayCache: Enabling Volatile Caches for Energy Harvesting Systems
Jianping Zeng, Jongouk Choi, Xinwei Fu, Ajay P. Shreepathi, Dongyoon Lee, Changwoo Min, and Changhee Jung
54th IEEE/ACM International Symposium on Microarchitecture (MICRO'21), Virtual, October 2021

CoSpec: Compiler Directed Speculative Intermittent Computation
Jongouk Choi, Qingrui Liu, and Changhee Jung
12th Annual Non-Volatile Memories Workshop (NVMW'21), Virtual, March 2021
Memorable Paper Award Finalist

[top-tier] CoSpec: Compiler Directed Speculative Intermittent Computation
Jongouk Choi, Qingrui Liu, and Changhee Jung
52nd IEEE/ACM International Symposium on Microarchitecture (MICRO'19), Columbus, Ohio, October 2019

[top-tier] Achieving Stagnation-Free Intermittent Computation with Boundary-Free Adaptive Execution
Jongouk Choi, Hyunwoo Joe, Yongjoo Kim, and Changhee Jung
25th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS'19), Montreal, Canada, April 2019

Real-time server overloaded monitoring algorithm using back propagation artificial neural network
Jongouk Choi, Chi Shen, Jens Hannemann, Siddhartha Bhattacharyya
IEEE 7th Annual Computing and Communication Workshop and Conference (CCWC'17), Las Vegas, Feb 2017

Teaching Activity

CDA 5106 Advanced Computer Architecture, Spring 2025
CDA 5106 Advanced Computer Architecture, Spring 2024
CDA 3103 Computer Logic and Organization, Fall 2023
CDA 5106 Advanced Computer Architecture, Spring 2023
CDA 3103 Computer Logic and Organization, Fall 2022

Advising

Chanhee Lee (UCF, Postdoc): Toward Self-Recoverable Persistent Memory Systems (Spring 2025-)
Derrick Greenspan (UCF, Postdoc): Software-Defined Memory Pool for Secure CXL-based Systems (Summer 2024-)
Noureldin Hassan (UCF, Ph.D student): Compiler-directed Nonvolatile Cache Management (Spring 2023-)
Junyeong Park (UCF, Ph.D student): Compiler-Directed Page Coloring (Fall 2023-)
Jaeseok Choi (UCF, Ph.D student): Rethinking Security of Embedded Systems in the Era of Battery-less IoT (Fall 2023-)
Sevitha Anandaraj (UCF, M.S student): Mitigation of EMI Attacks in Cyber-Physical Systems (Summer 2023-)
Byounguk Min (Purdue, Ph.D student): NV-GPU (2021-)

Alumni

Nicholas L'Heureux (UCF, M.S 2024)
Zhenyu Hu (UCF, M.S 2024): First employed at Red Cross

Dissertation Committee

Jiachen Guo (UCF, Ph.D candidate): Reconfigurable Load Modulated balanced Amplifier (Fall 2022-Present)

Grants

10/2025 - 9/2028, DARPA (in pending), $737,981, A Self-Recoverable Persistent Memory: A Novel Approach to Resilient Computing, PI: Choi, (Choi's share $737,981).
10/2025 - 9/2028, NSF (in pending), $600,000, Collaborative Research: SaTC: Small: Oblivious Power Management System: Towards Secure IoT Against Power Side-Channel Attacks, PI: Choi (UCF), PI: Kim (at Dartmouth), (Choi's share $300,000).

08/2025 - 7/2029, NSF (in pending), $1,200,000, CSR: Medium: Software-defined Memory Pool for CXL-based Systems, PI: Choi, Co-PI: Solihin, (Choi's share $600,000).
02/2024 - 7/2024, ETRI, $23,000, Rethinking Nonvolatile Memory for Secure Energy Harvesting Systems, Sole PI.
08/2023 - 07/2026, NSF, $600,000, Collaborative Research: CSR: Small: Caphammer: A New Security Exploit in Energy Harvesting Systems and its Countermeasures. Lead PI: Jongouk Choi (Choi's share $360,000).
05/2023 - 12/2023, ETRI, $75,000, Rethinking Capacitor Reliability for Secure Energy Harvesting Systems, Sole PI.
05/2023, UCF OR Mentoring Program Award, $3,000.

Awards / Achievements

Advisor of ACM SIGBED Student Research Competition (2024) 2nd Place Winner Junyeong Park
ACM SIGBED Paul Caspi Memorial Dissertation Award (2023)
Memorable Paper Award Finalist at NVMW'21 (2021)
1st Place - Graduate Student Competition - Kentucky Academy of Science (2017)
LG Electronics Vehicle Component Company Headquarter Award (2015)
Kentucky State University President Award (2012)
Kyonggi Governor Award, South Korea (2011)

Professional Service

Program Committee: ISCA'25 (LPC), DSN-DSML'24, GLSVLSI'24, LCTES'23, PACT'22 (SRC)
Organizing Committee: PACT'24 (Publications Chair), ISCA'23 (Publications Chair)
Journal Reviewer: ToC'24, TACO'24, TECS'24, TECS'23, CAL'22
Sub-reviewer: MICRO'24, ISCA'23, ISCA'22, CGO'22, ASPLOS'22, MICRO'21, ASPLOS'21, PPoPP'21, CGO'21, MICRO'20, PPoPP'20, CASES'20, CGO'20, MICRO'19, ASPLOS'19, CGO'19, ASPLOS'19, ASPLOS'18

Industry Activity

May 2020 – Aug. 2020, ARM Research, Austin, TX (Virtual), Supervised under Dr. Doug Joseph (ARM) and Advised by Dr. Fredrik Kjolstad (Stanford).
Aug. 2012 – Aug. 2015, LG Electronics, South Korea, Research Engineer.

Invited Talks

"Write-Light Cache for Energy Harvesting System"
15th Annual Non-Volatile Memories Workshop (NVMW'24), San Diego, March 2024

"Write-Light Cache for Energy Harvesting Systems"
50th ACM/IEEE International Symposium on Computer Architecture (ISCA), Orlando, June 2023

"Capacitor Error Resilience for Energy Harvesting Systems"
14th Annual Non-Volatile Memories Workshop (NVMW'23), San Diego, March 2023

"Compiler-Directed High-Performance Intermittent Computation for Energy Harvesting Systems"
14th Annual Non-Volatile Memories Workshop (NVMW'23), San Diego, March 2023

"Capacitor Error Resilience for Energy Harvesting Systems"
International Conference on Embedded Software (EMSOFT'22), Oct. 2022

"Compiler-Directed High-Performance Intermittent Computation for Energy Harvesting Systems"
28th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS'22), Virtual, May 2022

"Architecture/Compiler Co-design Approaches for High-Performance Energy Harvesting Systems"
CS 50200 (Fall'21), Purdue University, Oct. 2021

"CoSpec: Compiler Directed Speculative Intermittent Computation"
12th Annual Non-volatile Memories Worshop (NVMW'21), March 2021 (Virtual)

"Co-exploration of scalable 3D SoC architectures and compiler support on sparse linear algebra"
ARM Research, Austin, Texas, August 2021 (Virtual)

"CoSpec: Compiler Directed Speculative Intermittent Computation"
52nd IEEE/ACM International Symposium on Microarchitecture (MICRO'19), Columbus, Ohio, October 2019

"Achieving Stagnation-Free Intermittent Computation with Boundary-Free Adaptive Execution"
CS 4304 (Spring'19), Virginia Tech, April 2019

"Achieving Stagnation-Free Intermittent Computation with Boundary-Free Adaptive Execution"
25th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS'19), Montreal, Canada, April 2019

"Real-time server overloaded monitoring algorithm using back propagation artificial neural network"
IEEE 7th Annual Computing and Communication Workshop and Conference (CCWC'17), Las Vegas, Feb. 2017

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