Hung-Wei Tseng

Assistant Professor
Electrical and Computer Engineering
University of California, Riverside

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Appointments

Assistant Professor 2019-present
University of California, Riverside
Department of Electrical and Computer Engineering
Cooperating Faculty, Department of Computer Science and Engineering

Assistant Professor 2016-2019
North Carolina State University
Department of Computer Science

Postdoctoral Scholar 2014-2016
University of California, San Diego
Department of Computer Science and Engineering

Education

Ph.D., Computer Science & Engineering 2014
University of California, San Diego
Dissertation: Data-triggered threads
Advisor: Dean Tullsen

M.S., Computer Science 2005
National Taiwan University
Dissertation: An Energy-Efficient Virtual Memory System with Flash Memory as the Secondary Storage
Advisor: Chia-Lin Yang

B.S., Computer Science 2003
National Taiwan University

Refereed Journal and Conference Publications

Yu-Chia Liu and Hung-Wei Tseng. NDS: N-Dimensional Storage. In *54th Annual IEEE/ACM International Symposium on Microarchitecture*, MICRO 2021, 2021.

Kuan-Chieh Hsu and Hung-Wei Tseng. Accelerating Applications using Edge Tensor Processing Units. In *SC: The International Conference for High Performance Computing, Networking, Storage, and Analysis*, SC 2021, 2021.

Alec Rohloff, Zackary Allen, Kung-Min Lin, Joshua Okrend, Chengyi Nie, Yu-Chia Liu, and Hung-Wei Tseng. OpenUVR: Reducing Latency and Preserving Quality in Untethered Real-Time Virtual-Reality Gaming Platforms. In *27th IEEE Real-Time and Embedded Technology and Applications Symposium*, RTAS 2021, 2021.

Jinyoung Choi, Sergey Blagodurov, and Hung-Wei Tseng. Dancing in the Dark: Profiling in the Age of Tiered Memory. In *35th IEEE International Parallel and Distributed Processing Symposium*, IPDPS 2021, 2021.

Abenezer Wudenhe and Hung-Wei Tseng. TPUPoint: Automatically Characterizing Hardware Accelerated Data Center Machine Learning Program Behavior. In *2021 IEEE International Symposium on Performance Analysis of Systems and Software*, ISPASS 2021, 2021.

Yu-Ching Hu, Murtuza Taher Lokhandwala, Te I, and Hung-Wei Tseng. Varifocal Storage: Dynamic Multi-Resolution Data Storage. *IEEE Micro, Special Issue on the Top Picks from Computer Architecture Conferences*, 2020.

Yu-Ching Hu, Murtuza Taher Lokhandwala, Te I, and Hung-Wei Tseng. Dynamic Multi-Resolution Data Storage. In *52th Annual IEEE/ACM International Symposium on Microarchitecture*, MICRO 2019, 2019.

Kiran Kumar Matam, Gunjae Koo, Haipeng Zha, Hung-Wei Tseng, , and Murali Annavaram. GraphSSD: Graph Semantics Aware SSD. In *46th International Symposium on Computer Architecture*, ISCA 2019, 2019.

Te I, Murtuza Lokhandwala, Yu-Ching Hu, and Hung-Wei Tseng. Pensieve: a Machine Learning Assisted SSD Layer for Extending the Lifetime. In *IEEE International Conference on Computer Design*, ICCD 2018, 2018.

Hung-Wei Tseng, Qianchen Zhao, Yuxiao Zhou, Mark Gahagan, and Steven Swanson. Morpheus: Exploring the Potential of Near-Data Processing for Creating Application Objects in Heterogeneous Computing. *SIGOPS Operating Systems Review*, volume 51(2):71–83, August 2018.

Gunjae Koo, Kiran Kumar Matam, Te I, Hema Venkata Krishna Giri Narra, Jing Liand Hung-Wei Tseng, Steven Swanson, and Murali Annavaram. Summarizer: Trading Bandwidth with Computing Near Storage. In *50th Annual IEEE/ACM International Symposium on Microarchitecture*, MICRO 2017, 2017.

Yanqin Jin, Hung-Wei Tseng, Yannis Papakonstantinou, and Steven Swanson. Improving SSD lifetime with byte-addressable metadata. In *Proceedings of the International Symposium on Memory Systems*, MEMSYS 2017, pages 374–384, 2017.

Yanqin Jin, Hung-Wei Tseng, Steven Swanson, and Yannis Papakonstantinou. KAML: A Flexible, High-Performance Key-Value SSD. In *23th International Symposium on High Performance Computer Architecture*, HPCA 2017, 2017.

Jing Li, Hung-Wei Tseng, Chunbin Lin, Steven Swanson, and Yannis Papakonstantinou. HippogriffDB: Balancing I/O and GPU Bandwidth in Big Data Analytics. *Proceedings of the VLDB Endowment*, volume 9(14), 2016.

Hung-Wei Tseng, Qianchen Zhao, Yuxiao Zhou, Mark Gahagan, and Steven Swanson. Morpheus: Creating Application Objects Efficiently for Heterogeneous Computing. In *43rd International Symposium on Computer Architecture*, ISCA 2016, 2016.

Yang Liu, Hung-Wei Tseng, Mark Gahagan, Jing Li, Yanqin Jin, Logan Gunthorp, Stephen Bates, and Steven Swanson. Hippogriff: Efficiently Moving Data in Heterogeneous Computing Systems. In *34th IEEE International Conference on Computer Design*, ICCD 2016, 2016.

Yang Liu, Hung-Wei Tseng, and Steven Swanson. Scale Up MapReduce with I/O-Oriented Scheduling for the GPU. In *34th IEEE International Conference on Computer Design*, ICCD 2016, 2016.

Hung-Wei Tseng and Dean M. Tullsen. CDTT: Compiler-generated data-triggered threads. In *20th International Symposium on High Performance Computer Architecture*, HPCA 2014, pages 650–661, 2014.

Leo Porter, Saturnino Garcia, Hung-Wei Tseng, and Daniel Zingaro. Evaluating student understanding of core concepts in computer architecture. In *18th ACM Conference on Innovation and Technology in Computer Science Education*, ITiCSE 2013, pages 279–284, 2013.

Hung-Wei Tseng, Laura M. Grupp, and Steven Swanson. Underpowering NAND flash: Profits and perils. In *48th Design Automation Conference*, DAC 2013, pages 1–6, 2013.

Hung-Wei Tseng and Dean M. Tullsen. Software data-triggered threads. In *ACM SIGPLAN 2012 Conference on Object-Oriented Programming, Systems, Languages and Applications*, OOPSLA 2012, pages 703–716, 2012.

Hung-Wei Tseng and Dean M. Tullsen. Eliminating redundant computation and exposing parallelism through data-triggered threads. *IEEE Micro, Special Issue on the Top Picks from Computer Architecture Conferences*, volume 32:38–47, 2012.

Hung-Wei Tseng, Laura M. Grupp, and Steven Swanson. Understanding the impact of power loss on flash memory. In *48th Design Automation Conference*, DAC 2011, pages 35–40, 2011.

Hung-Wei Tseng and Dean M. Tullsen. Data-triggered threads: Eliminating redundant computation. In *17th International Symposium on High Performance Computer Architecture*, HPCA 2011, pages 181–192, 2011.

Han-Lin Li, Chia-Lin Yang, and Hung-Wei Tseng. Energy-aware flash memory management in virtual memory system. *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, volume 16(8):952–964, 2008.

Hung-Wei Tseng, Han-Lin Li, and Chia-Lin Yang. An energy-efficient virtual memory system with flash memory as the secondary storage. In *2006 International Symposium on Low Power Electronics and Design*, ISLPED 2006, pages 418–423, 2006.

Shih-Hsien Yang, Hung-Wei Tseng, Eric Hsiao-Kuang Wu, and Gen-Huey Chen. Utilization based duty cycle tuning mac protocol for wireless sensor networks. In *IEEE Global Telecommunications Conference, 2005*, GLOBECOM 2005, pages 3258–3262, 2005.

Chia-Lin Yang, Hung-Wei Tseng, Chia-Chiang Ho, and Ja-Ling Wu. Software-controlled cache architecture for energy efficiency. *IEEE Transactions on Circuits and Systems for Video Technology*, volume 15(5):634–644, 2005.

Chia-Lin Yang, Alvin R. Lebeck, Hung-Wei Tseng, and Chien-Hao Lee. Tolerating memory latency through push prefetching for pointer-intensive applications. *Transactions on Architecture and Code Optimization (TACO)*, volume 1(4):445–475, 2004.

Hung-Wei Tseng, Shih-Hsien Yang, Po-Yu Chuangi, Eric Hsiao-Kuang Wu, and Gen-Huey Chen. An energy consumption analytic model for a wireless sensor MAC protocol. In *IEEE 60th Vehicular Technology Conference*, VTC2004-Fall, pages 4533–4537, 2004.

Chia-Lin Yang, Hung-Wei Tseng, and Chia-Chiang Ho. Smart cache: An energy-efficient D-cache for a software MPEG-2 video decoder. In *2003 Joint Conference of the Fourth International Conference on Information, Communications and Signal Processing, 2003 and Fourth Pacific Rim Conference on Multimedia*, ICICS-PCM 2003, pages 1660–1664, 2003.

Workshops

Hung-Wei Tseng and Dean M. Tullsen. Data-triggered multithreading for near data processing. In *1st Workshop on Near-Data Processing*, WoNDP 2013, 2013.

Tech Reports

Hung-Wei Tseng, Yang Liu, Mark Gahagan, Jing Li, Yanqin Jin, and Steven Swanson. Gullfoss: Accelerating and simplifying data movement among heterogeneous computing and storage resources. Technical Report CS2015-1015, Department of Computer Science and Engineering, University of California, San Diego technical report, 2015.

Grant and Funding

CNS Core: Small: Re-engineering Applications for Tensor Processing Units
National Science Foundation $495,000.00. July, 20 – June, 2023

CSR: Small: IOQL: an I/O Interface for Near-Data Processing
National Science Foundation $499,515.00. August, 2018 – August, 2021

A Drop-in Upgradable Near-Data Processing Architecture for Machine Learning Applications in Heterogeneous Computers
Facebook Research $50,000.00. March, 2017

CRII: CSR: Rethinking the FTL in SSDs – a file translation layer instead of a flash translation layer
National Science Foundation $174,998.00. March, 2017 – March, 2020

Awards and Competitions

Outstanding Paper Award, the 27th IEEE Real-Time and Embedded Technology and Applications Symposium   2021

IEEE Micro's top picks from computer architecture conferences, "Varifocal Storage: Dynamic Multi-Resolution Data Storage"   2020

ACM/IEEE MICRO Best Paper Honorable Mention	2019

Facebook Research Award   2018

IEEE Micro's top picks from computer architecture conferences, "Eliminating Redundant Computation and Exposing Parallelism through Data-Triggered Threads"   2012

HPCA best student paper nominee   2011

National Taiwan University Student Service Education Award   2003

ACM International Collegiate Programming Contest (ICPC) Asia Regional, Taipei Site. 4th Place   2000

Presidential Award of National Taiwan University   1999, 2000, 2003

Teaching Experience

Assistant Professor, Department of Electrical and Computer Engineering/Department of Computer Science and Engineering, University of California, Riverside
- EE 260: Quantum Computer Architecture   2021 Spring
- EE 120A: Logic Design   2020 Spring. 2021 Spring
- CS 202: Advanced Operating Systems   2020 Winter, 2021 Winter
- EE 260: Trends in Computer System Design   2020 Winter
- CS 203: Advanced Computer Architecture   2019 Fall, 2020 Fall

Assistant Professor, Department of Computer Science, North Carolina State University
- CSC 456: Computer Architecture and Multiprocessors   2019 Spring, 2018 Spring
- CSC 501: Operating Systems Principles   2018 Fall, 2017 Fall, 2016 Fall
- CSC 236: Computer Organization and Assembly Language for Computer Scientist   2017 Spring

Lecturer, Department of Computer Science and Engineering, University of California, San Diego
- CSE 141: Introduction to Computer Architecture   2020 Summer, 2019 Summer, 2016 Summer, 2016 Spring, 2014 Summer, 2012 Summer
- CSE 141L: Project of Computer Architecture   2020 Summer, 2019 Summer, 2016 Summer, 2014 Summer, 2012 Summer

Teaching Assistant, Department of Computer Science and Engineering, University of California, San Diego
- CSE 141: Introduction to Computer Architecture   2009 Spring, 2009 Fall, 2010 Summer
- CSE 240A: Principle of Computer Architecture   2010 Winter
- CSE 8A: Introduction to Computer Science: Java   2009 Fall
- CSE 141L: Project of Computer Architecture   2009 Summer

Other Working Experience

Research Assistant, University of California, San Diego	Sep. 2007-Sep. 2014
Intern Software Engineer, Intel Labs, Santa Clara	June 2013–Sep. 2013
Software Engineer, Academia Sinica	Jan. 2007–Aug. 2007
Intern Software Engineer, Streaming 21 Inc.	July 2000–Aug 2000

Conference and Workshop Organization

Track Program Chair, The 2022 ACM/SIGAPP Symposium on Applied Computing (SAC)   2021–

Finance Chair, The 26th International Symposium on High-Performance Computer Architecture (HPCA) 2020

Local Arrangements Co-chair, 2018 IEEE International Symposium on Workload Characterization (IISWC) 2018

Registration Chair, The 45th International Symposium on Computer Architecture (ISCA)   2018

Web Chair, ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)   2018

Program Co-chair, Non-Volatile Memories Workshop   2018, 2017

Web Chair, IEEE Symposium on High Performance Computer Architecture (HPCA)   2017

Web Chair, IEEE/ACM International Symposium on Microarchitecture (MICRO)   2016

Submission Chair, IEEE Symposium on High Performance Computer Architecture (HPCA)   2013

Program/Steering Committee Member

Steering Committee Member, Non-Volatile Memories Workshop   2021, 2020, 2019

Program Committee Member, International Symposium on High-Performance Computer Architecture (HPCA)   2021, 2020

Program Committee Member, IEEE International Conference on Computer Design (ICCD)   2021, 2020, 2019, 2018, 2017

Program Committee Member, IEEE International Symposium on Workload Characterization (IISWC) 2021, 2018

Program Committee Member, IEEE International Conference on High Performance Computing, Data, and Analytics (HiPC)   2017

Program Committee Member, Non-Volatile Memory Systems and Applications Symposium (NVMSA) 2017

Program Committee Member, Workshop on Parallel Programming Models - Special Edition on Task Parallelism   2014–2016

Program Committee Member, Non-Volatile Memories Workshop   2016

Reviewers

Reviewer, IEEE Transactions on Very Large Scale Integration Systems   2012–

Reviewer, IEEE Computer Architecture Letters   2016–

Reviewer, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems   2018–

Reviewer, IEEE Transactions on Computers   2018–

Reviewer, IEEE Transactions on Embedded Computing Systems   2012–

External Reviewer, IEEE/ACM International Symposium on Microarchitecture   2021, 2020, 2019

External Reviewer, International Symposium on Computer Architecture   2020, 2017