

Kuan-Hsun Chen

Dr.-Ing.

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Present Work

- Sep. 2021 – Present **Assistant Professor (tenured since 01.05.2022)**, *Computer Architecture for Embedded Systems (CAES) group, University of Twente, the Netherlands.*
- Elected member and research committee chair of faculty council for the faculty of electrical engineering, mathematics and computer science (2022-2024)
 - Appointed member of Young Academy Twente (YAT) since 2024
- Courses:
- Operating Systems, for Technical Computer Science Bachelor
 - Programming in C, for Electronic Engineering Bachelor

Education

- 2015 – 2019 **Dr.-Ing. in Computer Science**, *TU Dortmund University, Germany.*
Dissertation Title: Optimization and Analysis for Dependable Application Software on Unreliable Hardware Platforms, defended on 22.05.2019
Rate: Auszeichnung (a.k.a. summa cum laude)
Dissertation Examiners: Prof. Dr. Jian-Jia Chen and Prof. Dr.-Ing. Rolf Ernst
- 2011 – 2013 **M.Sc in Computer Science**, *National Tsing Hua University, Taiwan.*
GPA 4.2 (Max 4.3)
Thesis: Support of Just-in-Time Compiler for Android on Indigenous Platforms
Supervisor: Prof. Jenq-Kuen Lee
- 2007 – 2011 **B.A. in Humanities and Social Sciences**, *National Tsing Hua University, Taiwan.*
Minor: Computer Science, 43 Credits

Professional Experience

- Aug. 2019 – Aug. 2021 **Postdoctoral Researcher**, *at the Chair of Design Automation for Embedded Systems, TU Dortmund University, Germany.*
DFG Projects:
- Collaborative Research Center (CRC/SFB 876): Providing Information by Resource-Constrained Data Analysis
 - DFG-MOST Project: Non-Volatile One Memory Architecture (NVM-OMA)
- Apr. 2014 – Jul. 2019 **Research Associate**, *at the Chair of Design Automation for Embedded Systems, TU Dortmund University, Germany.*
- Collaborative Research Center (CRC/SFB 876): Providing Information by Resource-Constrained Data Analysis
 - DFG Priority Program (SPP 1500) : Dependable Embedded Systems: Generating and Executing Dependable Application Software on Unreliable Embedded Systems
- Mar. 2013 – Mar. 2014 **Research Associate**, *at the Chair of Micro Hardware Technologies for Automation, Karlsruhe Institute of Technology, Germany.*
Projects:
- DFG Priority Program (SPP 1500): Dependable Embedded Systems: Generating and Executing Dependable Application Software on Unreliable Embedded Systems
- 2007 – 2012 **Research Intern on the Water Resources Agency Project**, *National Center for High-Performance Computing (NCHC), Hsinchu, Taiwan.*

Awards and Honors

Community Related

Outstanding Reviewer Award, International Conference on Hardware/Software Codesign and System Synthesis (CODE+ISSS), October 2024

Appointed Member of Young Academy Twente, University of Twente, 2024-2028

4TU.NIRICT Community Funding for "Dutch Real-Time Systems", Recipient

Invited Article by **ACM Special Interest Group on Embedded Systems (SIGBED)** for SIGBED Blog, May 2024

Promotion by ACM Special Interest Group on Design Automation (SIGDA) on "Who's who", May 2022

Research Related

Best Paper Award in Euromicro Conference on Real-Time Systems (ECRTS), 2023

Best Paper Candidate in ACM/IEEE Design, Automation & Test in Europe Conference (DATE), 2021

Programme for Project-Related Personal Exchange (PPP) (2021-2022), German Academic Exchange Service (DAAD), Principal Investigator, Germany

Postdoctoral Fellowship, Summer Programme, Japan Society for the Promotion of Science (JSPS) and German Academic Exchange Service (DAAD), 2021, Due to COVID, the visa was not granted.

Ph.D. Dissertation Award, TU Dortmund University, Germany, 2019

Ph.D. was distinguished as "**Summa cum Laude**", Dortmund, Germany, May 2019

Best Student Paper Award in IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA), 2018

Teaching Related

ASCI Research School Educational Grant for "**Design and Implementation of Real-Time Systems**", Recipient, 2023

University of Teaching Qualification, 4TU.Education, the Netherlands, 2022

P⁵-Project Group Practice Award, Alumni of Computer Science in TU Dortmund, Supervisor, 2020

Best Projektgruppe (based on teaching evaluation) for the Projektgruppe "PG629: F1/10-Autonomous Racing: Head-To-Head Racing Capabilities", 2020

Best Projektgruppe (based on teaching evaluation) for the Projektgruppe "F1/10-Autonomous Racing", 2019

Ten Selected Publications ([google scholar](#) | [scopus](#))

- [1] Tijmen T. Smit, Bruno Endres Forlin, **Kuan-Hsun Chen**, Ioanna Souvatzoglou, Mihalis Psarakis, Marco Ottavi. *An Enhanced Fault Injection Framework for FPGA-Based Soft-Cores*, In IEEE International Symposium on Defect and Fault Tolerance in VLSI and Nanotechnology Systems (DFT), In Press, 2024
- [2] Leonard David Bereholschi, Mikail Yayla, Jian-Jia Chen, **Kuan-Hsun Chen**, Asif Ali Khan. *Evaluating the Impact of Racetrack Memory Misalignment Faults on BNNs Performance*, In International Conference on Embedded Computer Systems: Architectures, Modeling and Simulation (SAMOS), In Press, 2024

- [3] Frank Ridder, **Kuan-Hsun Chen**, Nikolaos Alachiotis. *Accelerated Real-Time Classification of Evolving Data Streams using Adaptive Random Forests*, In International Conference on Field Programmable Technology (ICFPT), 2023
- [4] Nils Hölscher, Christian Hakert, Hassan Nassar, **Kuan-Hsun Chen**, Lars Bauer, Jian-Jia Chen, Jörg Henkel. *Memory Carousel: LLVM-Based Bitwise Wear Leveling for Nonvolatile Main Memory*, In IEEE Transaction of Computer Aided Design Integrated Circuits Systems (TCAD), 2023
- [5] Christian Hakert, **Kuan-Hsun Chen**, Horst Schirmeier, Lars Bauer, Paul R. Genssler, Georg von der Brüggen, Hussam Amrouch, Jörg Henkel, Jian-Jia Chen. *Software-Managed Read and Write Wear-Leveling for Non-Volatile Main Memory*, In ACM Transactions Embedded Computing Systems (TECS), 2022
- [6] Yen-Ting Tsou, **Kuan-Hsun Chen**, Chia-Lin Yang, Hsiang-Yun Cheng, Jian-Jia Chen, Der-Yu Tsai. *This is SPATEM! A Spatial-Temporal Optimization Framework for Efficient Inference on ReRAM-based CNN Accelerator*, In Asia and South Pacific Design Automation Conference (ASP-DAC), 2022
- [7] Christian Hakert, Asif-Ali Khan, **Kuan-Hsun Chen**, Fazal Hameed, Jeronimo Castrillon, Jian-Jia Chen. *Layout Optimization of Decision Trees on Racetrack Memory*, In ACM/IEEE Design Automation Conference (DAC), 2021
- [8] Mikail Yayla, Sebastian Buschjäger, Aniket Gupta, Jian-Jia Chen, Jörg Henkel, Katharina Morik, **Kuan-Hsun Chen**, Hussam Amrouch. *FeFET-based Binarized Neural Networks Under Temperature-dependent Bit Errors*, In IEEE Transactions on Computers (TC), 2021
- [9] Sebastian Buschjäger, **Kuan-Hsun Chen**, Jian-Jia Chen, Katharina Morik. *Realization of Random Forest for Real-Time Evaluation through Tree Framing*, In IEEE International Conference on Data Mining (ICDM), 2018
- [10] **Kuan-Hsun Chen**, Jian-Jia Chen, Florian Kriebel, Semeen Rehman, Muhammad Shafique, Jörg Henkel. *Task Mapping for Redundant Multi-threading in Multi-Cores with Reliability and Performance Heterogeneity*, In IEEE Transactions on Computers (TC), 2016

Invited Talks / Forums

- July. 2024 (Invited Talk) Costly and Unsafe? A good case for Reinforcement Learning, in **ML-RT Agenda Towards a research agenda for learning-enabled safety-critical real-time systems**, France
- May. 2024 (Invited Talk) Timely vs. In Time: A perspective in real-time systems, at "Special Day On Sustainable Computing", in Design, Automation & Test in Europe Conference, Valencia, Spain
- May. 2023 (Keynote) Good Old Trees along with Emerging Memories, in 28th Workshop on Compiler Techniques and System Software for High-Performance and Embedding Computing
- Sep. 2022 (Invited Talk) Doing University Teaching Qualification as Doing Research, UTQ Ceremony, in University of Twente, the Netherlands
- Sep. 2021 (Invited Lecture) Dependable Real-Time Embedded Systems, Conference of Taiwan Elite in DACH-region on Advanced Engineering and Biomedical Technologies, Germany
- Dec. 2019 (Invited Talk) Compensate or Ignore? Meeting Control Robustness Requirements through Adaptive Soft-Error Handling, in **Diskussionskreis Fehlertoleranz** at TU Dortmund, Germany
- Jun. 2019 (PhD Forums) Optimization and Analysis for Dependable Software on Unreliable Hardware Platforms, in ACM/SIGDA at the IEEE/ACM 55th Design Automation Conference (DAC), USA

Academic Activities

Journal Editors

- 2024 – present Associate Editor, IEEE Nanotechnology Magazine
- 2023 – present Review Editor, Integrated Circuits and VLSI, speciality section of Frontiers in Electronics
- Guest Editor, Special Issue on In/Near Memory and Storage Computing for Embedded Systems in ACM Transactions on Embedded Computing Systems (TECS)
- Guest Editor, Special Issue on Fault-Resilient Cyber-Physical Systems in ACM Transactions on Cyber-Physical Systems (TCPS)
- Guest Editor, Special Issue on Systems Optimizations for DSP and AI Applications in Springer Journal of Signal Processing Systems (JSPS)

Conference/Workshop Chairs

- 2025 Co-Chair, Ph.D. Forum at CPS-IoT Week
- 2024 – 2025 Chair, Workshop on Operating Systems Platforms for Embedded Real-Time Applications (OSPRT)
- 2024 Publicity Chair, Euromicro Conference on Real-Time Systems (ECRTS)
- 2024 Webchair, IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS)
- 2024 Webchair, IEEE Real-Time Systems Symposium (RTSS)
- 2024 Submission Chair, International Conference on Hardware/Software Codesign and System Synthesis (CODES+ISSS)
- 2023 Multimedia Chair, IEEE Real-Time Systems Symposium (RTSS)
- 2023 Co-Chair, ASCI National Conference for Dutch Computer Systems (CompSys)
- 2023 Social-Media Chair for Euromicro Conference on Real-Time Systems (ECRTS)
- 2023 Multimedia Chair for International Conference on Real-Time Networks and Systems (RTNS)
- 2021 Multimedia Chair, IEEE Real-Time Systems Symposium (RTSS)

Technical Program Committees, Member of

- 2024 ACM/USENIX/IFIP Middleware Conference (MIDDLEWARE)
- 2023 – 2024 IEEE International Symposium on Defect and Fault Tolerance in VLSI and Nanotechnology (DFT)
- 2022 IEEE International Conference on High Performance Computing, Data, & Analytics (HiPC)
- 2023 – 2024 ACM/IEEE International Conference on Computer-Aided Design (ICCAD)
- 2024 – 2025 ACM/IEEE Design, Automation & Test in Europe Conference & Exhibition (DATE)
- 2024 ACM/IEEE International Conference on Compilers, Architectures, and Synthesis for Embedded Systems (CASES)
- 2023 – 2024 ACM/IEEE International Conference on Hardware/Software Codesign and System Synthesis
- 2023 – 2025 Asia and South Pacific Design Automation Conference (ASP-DAC)
- 2021,2024 IEEE Real-Time Systems Symposium (RTSS)
- 2023 – 2024 IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS)
- 2021 – 2024 IEEE International Conference on Embedded and Real-Time Computing Systems and Application (RTCSA)
- 2024 IEEE International Conference on Emerging Technologies and Factory Automation (ETFA)
- 2023 – 2024 IEEE Real-Time Systems Symposium Artifact Evaluation (RTSS-AE)
- 2024 Euromicro Conference on Real-Time Systems Artifact Evaluation (ECRTS-AE)
- 2023 – 2024 European Conference on Machine Learning and Knowledge Discovery in Databases (ECML-PKDD)
- 2024 ACM/IEEE International Symposium on Machine Learning for CAD (MLCAD)
- 2020, 2022 – 2023 ACM/IEEE Workshop on Machine Learning for CAD (MLCAD)