

# Kuan-Hsun Chen

Dr.-Ing.

 <https://khchen.eu/>

## Present Work

- Since Sep. 2021 **Assistant Professor (UD1, tenured)**, *Computer Architecture for Embedded Systems (CAES) group, University of Twente, the Netherlands.*
- Appointed member of Young Academy Twente (YAT) since 2024 for 4 years
  - Elected member and research committee chair of faculty council for the faculty of electrical engineering, mathematics and computer science (2022 – 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 (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 (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.*

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## Awards and Honors

### Community Related

**Outstanding Reviewer Award**, ACM 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**, Japan Society for the Promotion of Science (JSPS) and German Academic Exchange Service (DAAD), 2021, due to COVID, 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

**Project Group Practice Award**, Alumni of Informatik in TUDo, Supervisor, 2020

**Best Projektgruppe** (based on teaching eval.), "PG629: F1/10-Autonomous Racing: Head-To-Head Racing Capabilities", 2020

**Best Projektgruppe** (based on teaching eval.), "F1/10-Autonomous Racing", 2019

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

- [1] Elijah Seth Cishugi, Sebastian Buschjäger, Martijn Noorlander, Marco Ottavi and **Kuan-Hsun Chen**. *TrackScorer: Skyrmion Logic-in-Memory Accelerator for Tree-based Ranking Models*, In ACM/IEEE Design, Automation & Test in Europe Conference & Exhibition (DATE), 2025, In press
- [2] Hassan Nassar, Ming-Liang Wei, Chia-Lin Yang, Jörg Henkel, **Kuan-Hsun Chen**. *PEAR: Non-Volatile Memory PUF with Endurance-Aware Resilience against Learning-based Attacks*, In ACM/IEEE Design, Automation & Test in Europe Conference & Exhibition (DATE), 2025, In Press
- [3] ChiaHui Su, Chia-Hua Ku, Jenq Kuen Lee, **Kuan-Hsun Chen**. *TreeHouse: An MLIR-based Compilation Flow for Real-Time Tree-based Inference*, In ACM Trans. Embed. Comput. Syst. (ACM-TECS), 2024, Just Accepted

- [4] Bruno Endres Forlin, **Kuan-Hsun Chen**, Nikolaos Alachiotis, Luca Cassano, Marco Ottavi. *Lightweight Instrumentation for Accurate Performance Monitoring in RTOSes*, In Design, Automation & Test in Europe Conference & Exhibition (DATE), 2024
- [5] Junjie Shi, Niklas Ueter, Jian-Jia Chen, **Kuan-Hsun Chen**. *Average Task Execution Time Minimization under  $(m,k)$  Soft-Error Constraint*. In IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), 2023
- [6] 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
- [7] Mario Günzel, Harun Teper, **Kuan-Hsun Chen**, Georg von der Brüggen, Jian-Jia Chen, *On the Equivalence of Maximum Reaction Time and Maximum Data Age for Cause-Effect Chains*, In Euromicro Conference on Real-Time Systems (ECRTS), 2023, **(Best Paper Award)**
- [8] 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 (ACM-TECS), 2022
- [9] **Kuan-Hsun Chen**, Mario Günzel, Boguslaw Jablkowski, Markus Buschhoff, Jian-Jia Chen. *Unikernel-Based Real-Time Virtualization under Deferrable Servers: Analysis and Realization*, In Euromicro Conference on Real-Time Systems (ECRTS), 2022
- [10] **Kuan-Hsun Chen**, Mario Günzel, Georg von der Brüggen, Jian-Jia Chen. *Critical Instant for Probabilistic Timing Guarantees: Refuted and Revisited*, In IEEE Real-Time Systems Symposium (RTSS), 2022

## Invited Talks / Forums / Panels

- Oct. 2024 (Panellist) How to Enhance The Research cooperation between Taiwan and the Netherlands/European Countries: Perspectives from Young Scholars, in Taiwan Research Days, Rotterdam, in the Netherlands
- 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

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

### Conference/Workshop Chairs

- 2025 Co-Chair, Ph.D. Forum at CPS-IoT Week
- 2025 Chair, Annual workshop on Operating Systems Platforms for Embedded Real-Time Applications (OSPRT)
- 2025 Co-Publicity Chair, IEEE International Conference on Embedded and Real-Time Computing Systems and Application (RTCSA)
- 2024 Co-Chair, Annual 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, ACM/IEEE 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)
- 2021 Multimedia Chair, IEEE Real-Time Systems Symposium (RTSS)

### Technical Program Committees, Member of

- 2025 ACM/IEEE Design Automation Conference (DAC)
- 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 (CODES+ISSS)
- 2021, 2024 IEEE Real-Time Systems Symposium (RTSS)
- 2023 – 2025 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 – 2025 ACM/USENIX/IFIP Middleware Conference (MIDDLEWARE)
- 2023 – 2024 European Conference on Machine Learning and Knowledge Discovery in Databases (ECML-PKDD)
- 2023 – 2024 IEEE International Symposium on Defect and Fault Tolerance in VLSI and Nanotechnology (DFTS)
- 2024 – 2025 ACM/IEEE International Symposium on Machine Learning for CAD (MLCAD)
- 2022 IEEE International Conference on High Performance Computing, Data, & Analytics (HiPC)

### Other Membership

- Since 2022 Member HiPEAC European Network of Excellence on High Performance and Embedded Architecture and Compilation.