

KUAN-YU CHANG

DESIGN VERIFICATION ENGINEER

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PROFESSIONAL EXPERIENCES

Design Verification Engineer

Logic Design Division II, IC Design Center
ASMedia Technology Inc., New Taipei City, Taiwan
Jul. 2023 - present



- Universal Serial Bus 4 (USB4[®]), Version 1.0 [Read more]
 - Perform the design verification utilizing Synopsys[®] VC Verification IPs [Read more]
 - Develop compliance test cases based on USB4CV Compliance Test Specification (CTS). [Read more]
 - * USB4[™] Host Interface Compliance Test Specification
 - Host-to-Host (H2H) Tunneling transfer in Raw mode and Frame mode
 - End-to-End Flow Control
 - Multiple H2H Tunneling Paths (up to 20 paths operate concurrently)
 - * USB4[™] Logical Layer Compliance Test Specification for Router Assemblies
 - Lane Initialization including Phases and Lane Adapter States
 - Entry and Exit of Low Power States including CL2, CL1, and CL0s
 - Operation with Re-timers placed on a Link (up to six Re-timers)
 - * USB4[™] Protocol Compliance Test Specification
 - The Header Error Control (HEC) and the Error Correction Code (ECC) in a Transport Layer Packet
 - Several Flow Control (FC) schemes including Dedicated FC and Shared FC
 - Path Configuration including setup and teardown
 - Enhance Bus Functional Models (BFMs) that are co-worked with the RTL designs
 - * The BFM for controlling the Sideband Channel
 - * The BFM for accessing the Host Interface Adapter Layer's programming interface
 - Improve coverage rate via developing several test vectors that are not included in the USB4CV CTS
 - Develop test cases for profiling H2H performance as well as analyze potential bottlenecks

Verification IP (VIP) Engineer (RDSS)¹

Upper Layer Group of PCIe VIP Team
Avery Design Systems, Inc., Taipei City, Taiwan²
Jul. 2021 - Apr. 2023



- PCI Express[®] (PCIe[®]) 6.0 [Read more]
 - Enhance the Bus Functional Model (BFM) to support Flit mode.
 - * Flit_Marker mechanism
 - * Flit Ack, Nak, and Discard Rules
 - * Flit Replay Rules (especially the Selective Replay)
 - Enhance / Develop compliance test cases for Flit mode.
 - * 14-Bit Tag mechanism
 - * Orthogonal Header Content (OHC) of Transaction Layer Packets
 - * Shared Flow Control with extended virtual channels
- Streaming Fabric Interface (SFI), Revision 1.0 [Read more]
 - Design the architecture of the BFM.
 - Lead the schedule of the product development.

¹RDSS stands for Research and Development Substitute Services.

²Siemens Digital Industries Software acquired Avery Design Systems, Inc. in March 2023. [Read more]

- Develop the functionality to align with the latest specification.
- Resolved **350+** issues while supporting customers on the bug tracking system (Bugzilla)
 - **67.33%** Customer Issues / **27.56%** Product Enhancements
- Contributed **13k+** lines of SystemVerilog code on the Concurrent Versions System (CVS, Linux)
 - **16.07%** PCIe BFM / **25.96%** SFI BFM / **57.97%** Test cases

Research Assistant

ELSA Laboratory

National Tsing Hua University, Hsinchu City, Taiwan³

Feb. 2016 - Jun. 2021



- Research Interests
 - Design Automation for Quantum Computing [1]
 - Artificial Intelligence and Machine Learning [2], [3]
 - Evolutionary Learning and Optimization [2]
- Linux System Administration
 - Customization of Development Environments
 - Maintenance of Computational Servers
 - Construction of IT Infrastructure

EDUCATION

National Tsing Hua University, Hsinchu City, Taiwan

Advisor: Prof. Chun-Yi Lee



- M.S. in Computer Science – Jun. 2021
 - **Master's Thesis:** *Mapping Nearest Neighbor Compliant Quantum Circuits onto a 2-D Hexagonal Architecture* [Read more]
- B.S. in Interdisciplinary Program of Science – Jun. 2017
 - Double expertise in *Computer Science* and *Chemistry*

PUBLICATIONS

(* denotes the communication author)

- [1] **K.-Y. Chang*** and C.-Y. Lee, "Mapping Nearest Neighbor Compliant Quantum Circuits onto a 2-D Hexagonal Architecture," *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 41, no. 10, pp. 3373–3386, Oct. 2022. DOI: 10.1109/TCAD.2021.3127868.
- [2] Y.-H. Chang, **K.-Y. Chang**, H. Kuo, and C.-Y. Lee*, "Reusability and Transferability of Macro Actions for Reinforcement Learning," *ACM Transactions on Evolutionary Learning and Optimization (TELO)*, vol. 2, no. 1, Apr. 2022. DOI: 10.1145/3514260.
- [3] Y.-M. Chen, **K.-Y. Chang**, C. Liu, T.-C. Hsiao, Z.-W. Hong, and C.-Y. Lee*, "Composing Synergistic Macro Actions for Reinforcement Learning Agents," *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)*, vol. 35, no. 5, pp. 7251–7258, May 2024. DOI: 10.1109/TNNLS.2022.3213606.

³ELSA Lab has moved to National Taiwan University, Taipei City, Taiwan since 2024.