Jen-Hao Cheng

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2-nd year Ph.D. student at Information Processing Lab,
Department of Electrical & Computer Engineering, University of Washington
Advisor: Dr. Jenq-Neng Hwang
Research Direction: Vision + Language / Computer Vision

Education

2023 – Now **Ph.D. Electrical and Computer Engineering**
University of Washington

2021 – 2023 **M.S. Electrical and Computer Engineering**
University of Washington

2015 – 2019 **B.S. Electrical Engineering**
National Taiwan University
Advisors: Dr. Lung-Pan Cheng and Dr. Wanjiun Liao

Publication

1. H.-I. Liu, C. Wu, **J.-H. Cheng**, W. Chai, S.-Y. Wang, G. Liu, J.-N. Hwang, H.-H. Shuai, and W.-H. Cheng, "Monotakd: Teaching assistant knowledge distillation for monocular 3d object detection," in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2025.
2. **J.-H. Cheng**, Y.-H. Ho, S. Y. Kuan, Z. Jiang, W. Chai, H.-W. Huang, J.-N. Hwang, and C.-L. Lin, "Rt-pose: A 4d radar-tensor based 3d human pose estimation and localization benchmark," in *ECCV*, 2024.
3. **J.-H. Cheng**, S.-Y. Kuan, H.-I. Liu, H. Latapie, G. Liu, and J.-N. Hwang, "Centerradarnet: Joint 3d object detection and tracking framework using 4d fmcw radar," in *2024 IEEE International Conference on Image Processing (ICIP)*, 2024.
4. **J.-H. Cheng**, Y. Wang, J.-T. Huang, S.-Y. Kuan, Q. Fu, C. Ni, S. Hao, G. Wang, G. Xing, H. Liu, and J.-N. Hwang, "Vision meets mmwave radar: 3d object perception benchmark for autonomous driving," in *IEEE Intelligent Vehicles Symposium (IV)*, 2024.
5. S. Y. Kuan, **J.-H. Cheng**, H.-W. Huang, W. Chai, C.-Y. Yang, B.-F. Wu, and J.-N. Hwang, "Boosting online 3d multi-object tracking through camera-radar cross check," in *IEEE Intelligent Vehicles Symposium (IV)*, 2024.
6. P. Z. Ramirez, ..., **J.-H. Cheng**, H.-I. Liu, H.-W. Huang, C.-Y. Yang, Z. Jiang, Y.-H. Peng, A. Huang, and J.-N. Hwang, "Ntire 2024 challenge on hr depth from images of specular and transparent surfaces," in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024.
7. **J.-H. Cheng**, Y. Chen, T.-Y. Chang, H.-E. Lin, P.-Y. C. Wang, and L.-P. Cheng, "Impossible staircase: Vertically real walking in an infinite virtual tower," in *IEEE Virtual Reality and 3D User Interfaces (VR)*, 2021. DOI: 10.1109/VR50410.2021.00025.
8. P.-Y. Wang, C.-H. Xu, P.-Y. Wang, H.-Y. Huang, Y.-W. Chang, **J.-H. Cheng**, Y.-H. Lin, and L.-P. Cheng, "Game illusionization: A workflow for applying optical illusions to video games," in *ACM Symposium on User Interface Software and Technology (UIST)*, 2021. DOI: 10.1145/3472749.3474824.

9 Y.-H. Hsu, **J.-H. Cheng**, K.-Y. Liao, Y.-S. Wang, T.-H. Chen, H.-Y. Chen, C.-K. Yen, and W. Liao, "Ntu smart edge for wireless virtual reality," in *2020 IEEE International Conference on Consumer Electronics - Taiwan (ICCE-Taiwan)*, 2020. DOI: 10.1109/ICCE-Taiwan49838.2020.9258121.

10 H.-Y. Huang, C.-W. Ning, P.-Y. Wang, **J.-H. Cheng**, and L.-P. Cheng, "Haptic-go-round: A surrounding platform for encounter-type haptics in virtual reality experiences," in *ACM Conference on Human Factors in Computing Systems (CHI)*, 2020. DOI: 10.1145/3313831.3376476.

Research Experience

Information Processing Lab, University of Washington (Jan. 2022 - Now)

- Multi-modal large-language-model-enabled autonomous driving system
- Human pose estimation using radar and camera
- Vision language model for video understanding
- 3D computer vision and sensor fusion for autonomous driving perception system

Human-Computer Interaction Lab, National Taiwan University (Jul. 2019 - Mar. 2021)

- Virtual Reality (VR) and haptic device research
- Human-computer interaction (HCI) and user interface research

Internet Research Lab, National Taiwan University (Jul. 2018 - Mar. 2020)

- Implemented 5G and Multi-Access Edge Computing (MEC) video streaming applications for mobile VR devices with Unity3D, a 5G base station, and a MEC server

Work Experience

Industry

2024 Summer, Fall — Research Intern, Generative AI, Microsoft
Collaborators: Qin Cai, Yi-Ling Chen , Vibhav Vineet

- Training multi-modal language models to better align with videos for temporal understanding
- Constructed a data annotation pipeline and created large-scale video data for SFT training
- Model evaluation on public video temporal understanding benchmarks and achieved state-of-the-art performance

Work Experience (continued)

Academic

2022 Winter -2024 Spring

Graduate Research Assistant Supported by Cisco
Collaborators: Hugo Latapie, Gaowen Liu

- Achieved Camera 3D Object Detection state-of-the-art performance (MonoTAKD published in CVPR 2025)
- State-of-the-art radar 3D object detector (CenterRadarNet published in IEEE ICIP 2024)
- Novel mulit-modal 3D object detection and tracking framework (published in IEEE IV 2024)
- Implemented a data collection system consisting of FMCW radar, LiDAR, and stereo camera based on ROS and collected novel real-world perception dataset for autonomous driving (published in IEEE IV 2024)

2022, 2023, 2024 Fall

Teaching Assistant, Deep Learning for Big Visual Data (Graduate Level)

2023 Winter

Teaching Assistant, Digital Signals And Filtering (Undergraduate Level)

2019 Summer -2021 Spring

Research Assistant, Computer Science at National Taiwan University
Advisor: Lung-Pan Cheng,

- Built novel VR systems: Impossible Staircase published in IEEE VR 2021, Hpatic-go-round published in ACM CHI 2020
- Achieved novel Multi-person VR experiences by creating cool applications using Unity3D.
- Implemented haptic devices with Soc (ESP8266, ESP32)
- Conducted Human Computer Interaction research including user interface and user studies