Weikai Lin

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Rochester, New York - 14620, USA

Research Interests

I am a Ph.D. student at the University of Rochester with a focus on Computer Graphics, VR/AR, Sensor Design, Computer Architecture, and Robotics. My goal is to bridge the gap between hardware and software through system-level design and optimization.

Education

- **University of Rochester** *2023 - 2028 (Expected)*
  Ph.D., Computer Science NY, USA
  - Advisor: Yuhao Zhu
  - Research Interests: Computer Graphics, VR/AR, Sensor Design, Computer Architecture.

- **Peking University** *2020 - 2023*
  M.Sc., Intelligence Science and Technology Beijing, China
  - GPA : 3.73 / 4.0, equivalent to 90+ / 100
  - Thesis: Sensorimotor coordinated unmanned vehicle autonomous exploration and mapping in unknown environment. Advisor : Dingsheng Luo
  - Research Interests: Artificial Intelligence, Autonomous Driving, Robotics.

- **Tsinghua University** *2016 - 2020*
  B.E., Electronic Engineering Beijing, China
  - Thesis: High-Speed Encoder and Decoder Design and Implementation for Terahertz Communication. Advisor: Su Li
  - Research Interests: Software-Hardware Co-design, Error Correction Code in Wireless Communication System.

Work Experience

- **Advanced Micro Devices, Inc. (AMD)** *2022.7 - 2023.2*
  Co-Op / Intern Beijing, China
  - SLAMs for Autonomous Driving System.
  - AMD GPUs Testing and Evaluation.

- **Chinese Academy of Science (CAS)** *2021 - 2022*
  Co-Op / Intern Beijing, China
  - HLS-based (High-Level-Synthesis) wireless communication system development.

- **Cambricon Technologies Co., Ltd.** *2019.7 - 2019.8*
  Co-Op / Intern Beijing, China
  - Neural Networks pruning.

Publications

C=Conference, J=Journal, A=Arxiv, P=Pattern, * : Equal contribution

[C.1] [HW, VR, CG] **MetaSapiens: Real-Time Neural Rendering with Efficiency-Aware Pruning and Accelerated Foveated Rendering.**
Weikai Lin*, Yu Feng*, and Yuhao Zhu
Accepted to *ASPLOS 2025 (ACM International Conference on Architectural Support for Programming Languages and Operating Systems 2025)*.
[Project]

[C.2] [AI, CV] **Private-Eye: In-Sensor Privacy Preservation Through Optical Feature Separation.**
Adith Boloor, **Weikai Lin**, Tianrui Ma, Yu Feng, Yuhao Zhu, Xuan Zhang
Accepted to *WACV 2025 (IEEE/CVF Winter Conference on Applications of Computer Vision 2025)*.

[J.1] [HW, VR, CG] **Potamoi: Accelerating Neural Rendering via a Unified Streaming Architecture.**
Yu Feng*, **Weikai Lin***, Zihan Liu, Jingwen Leng, Minyi Guo, Han Zhao, Xiaofeng Hou, Jieru Zhao, Yuhao Zhu
In *TACO 2024 (ACM Transactions on Architecture and Code Optimization)*.
[Paper]

[A.1] [VR, CG] **RTGS: Enabling Real-Time Gaussian Splatting on Mobile Devices Using Efficiency-Guided Pruning and Foveated Rendering.**
Weikai Lin, Yu Feng, and Yuhao Zhu
In *arXiv preprint arXiv:2407.00435*, 2024.
(Preprint and Shortened Version of MetaSapiens)
[Paper] [Code]

[C.3] [Robotics] **OW3Det: Toward Open-World 3D Object Detection for Autonomous Driving.**
Wenfei Hu, **Weikai Lin**, Hongyu Fang, Yi Wang, Dingsheng Luo
Accepted to *IROS 2024 (IEEE/RSJ International Conference on Intelligent Robots and Systems 2024)*.

[C.4] [Robotics] **Learning Clear Class Separation for Open-Set 3D Detector in Autonomous Vehicle Via Selective Forgetting.**
Wenfei Hu, **Weikai Lin**, Hongyu Fang, Yi Wang, Dingsheng Luo
In *RO-MAN 2023 (2023 32nd IEEE International Conference on Robot and Human Interactive Communication)*.

[J.2] [Robotics] **A Review of Robot Learning.**
Qu, W., Liu, T., **Lin, W.**, & Luo, D.
In *Beijing Da Xue Xue Bao*, 59(6), 1069-1086, 2023. DOI: 10.13209/j.0479-8023.2023.086.

[C.5] [Robotics] **Approaching Sound Object with Sensorimotor Coordination when Sensors Partially Damaged.**
Shuai Fang, Yaoyao Wei, **Weikai Lin**, Jianan Zhang, Tianlin Liu, and Dingsheng Luo
In *ICDL 2021 (2021 IEEE International Conference on Development and Learning)*.

[C.6] [Robotics] **Acquiring Robot Navigation Skill with Knowledge Learned from Demonstration**.
Yaoyao Wei, Shuai Fang, **Weikai Lin**, Jianan Zhang, and Dingsheng Luo
In *ICDL 2021 (2021 IEEE International Conference on Development and Learning)*.

[P.1] [Robotics] **Control Method and System for Improving Operation Precision of Robot Arm.**
Dingsheng Luo, Xihong Wu, Yifan Yuan, Wenfei Hu, Weiming Qu, Yudi Zou, Jiawen Wang, Hongyu Fang, **Weikai Lin**
In *CN202310068025.4*, China. Published as CN116079730A, 2023.

[P.2] [Robotics] **Active Auditory Positioning Method for Map-Free Navigation.**
Dingsheng Luo, Xihong Wu, Shuai Fang, Jianan Zhang, **Weikai Lin**, Tianlin Liu
In *CN202210079214.7*, China. Published as CN114563011A, 2022.

[P.3] [Robotics] **Robot Map-Free Navigation Method Based on Time Sequence Information Modeling.**
Dingsheng Luo, Xihong Wu, Jianan Zhang, Shuai Fang, Tianlin Liu, **Weikai Lin**, Hongyu Fang
In *CN202110018866.5*, China. Published as CN112857370A, 2021.

PROJECTS

[PJ.1] [FPGA, VR] **Exploiting Human Color Discrimination for Memoryand Energy-Efficient Image Encoding in Virtual Reality: An FPGA Demo.**
Open-Sourced Project, including highly optimized CPU/GPU/FPGA implementations.
[Code]

HONORS AND AWARDS

- **Baosteel's Outstanding Student Award for HMT Students** *2022*
  Peking University
  ◦ Awarded to top-performing students annually, only 9 recipients in 2022, recognizing exceptional achievement.
- **First Prize in Peking University Challenge Cup** *2022*
  Peking University
  ◦ University-level honor awarded for outstanding student innovation and invention.
- **First Class Scholarship, Scholarship for Taiwan Master's Students** *2021*
  Peking University
  ◦ Awarded to top-performing students annually, recognizing academic excellence among students.

TEACHING EXPERIENCE

- **University of Rochester** *2024 - present*
  Teaching Assistant
  ◦ CSC 257/457: Computer Networks
- **Peking University** *2021 - 2022*
  Teaching Assistant
  ◦ Probability Theory and Statistics (Level A)
  ◦ Introduction to Artificial Intelligence

ACADEMIC SERVICE

• **IEEE ICDL 2021**, Website Chair *2021*

ADDITIONAL INFORMATION

Languages: Chinese (Native), English (Good)
Interests: Baseball, FPGAs