Wenhao Sun

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Researching Experience

Benchmarking real time workload on advance processors   Nov 2024 – Now

- Goal: Comprehensive workload analysis helps designers optimize system performance, resource allocation, and ensure application requirements are met.
- Method: Analyzing the execution behavior and influence of real-time tasks on advanced processor features (OoO, BP and LLC)

Efficient Robotics Computing System   Nov 2023 – Nov 2024

- Designed a comprehensive perception-judgment-decision-execution pipeline for embodied robots and conducted experiments in both simulation and open real-world environments.
- Achieved robust close-loop task completion success rates on par with SOTA methods while reducing computational cost by 6.6x.

Optimize Real-Time Embedding System For Embodied AI   Jan 2023 – Nov 2023

- Enhanced Linux to support both real-time and non-real-time capabilities, enabling motion control in the real-time domain and AI model inference in the non-real-time domain without interference.
- Successfully tested with 128 industrial servo motors under 4000 ms EtherCAT cycle, maintaining embedding system jitter within 50 μs

Researching Interest

Embodied AI System Hardware-Software Co-Design

- Hardware: Efficent and real-time hardware with Embodied AI application.
- Algorithm: Efficent Embodied Robotics computing pipeline enable robot thinking easily.
- Software: Real-time OS and toolchain friendly for robotics, controlling, and Embodied AI system.

Education

Institute of Computing Technology, Chinese Academy of Sciences (ICT, CAS)   Sep 2023 – Now
MS in Computer Science

- GPA: 3.8/4.0   Ranking: 5% (Estimated)
- Advisor: Prof. Yinhe Han and Dr. Yiming Gan

Hefei Uniersity of Technology (HFUT)   Sep 2019 – June 2023
BS in Survey and Mapping

- GPA: 3.5/4.3   Ranking: 3/37 (Obtain the guaranteed admission)
- Advisor: Assoc. Prof. Chunju Zhang

Publications

DaDu-E: Rethinking the Role of Large Language Model in Robotic Computing Pipeline   *Submitted Dec 2024*
(Submitted to Journal of Field Robotics, JFR)

<u>Wenhao Sun</u>, Sai Hou, Zixuan Wang, Bo Yu, Shaoshan Liu, Xu Yang, Shuai Liang, Yiming Gan, Yinhe Han

Paper ▶ Demo

Aphelios: A Selective Lock-step Neural Processing Unit Design   *Accepted Apr 2025*
(Accepted by The 35th edition of ACM/IEEE Great Lakes Symposium on VLSI, GLSVLSI 2025)

<u>Wenhao Sun</u>, Yiming Gan, Yuhui Hao, Yinhe Han

Investigating Performance and Real-Time Trade-offs in Out-of-Order Processors   *Accepted May 2025*
(Accepted by Workshop of 2025 International Symposium on Computer Architecture, ISCA 2025)

<u>Wenhao Sun</u>, Yuhui Hao, Yiyang Huang

KARMA: Augmenting Embodied AI Agents with Long-and-short Term Memory Systems
(Accepted by 2025 IEEE International Conference on Robotics & Automation, ICRA 2025)

Zixuan Wang, Bo Yu, Junzhe Zhao, <u>**Wenhao Sun**</u>, Sai Hou, Shuai Liang, Xing Hu, Yinhe Han, Yiming Gan

Paper ▶ **Demo**

Internship

Embedded Software and Operating System Engineer, Sinsegye   Feb 2023 – Aug 2023

- Optimized Linux real-time performance on diverse kinds of CPU/GPU.
- Tested performance of servos, PLC controllers and kinds of hardware devices.
- Adapting Cambrion NPU on the real-time embedding system.

Technologies

Languages: Python, C/C++, Verilog, Shell, ST, SQL

System: Linux, ROS, Gem5, Xenomai

Tools: Gazebo, Moveit, GDB, Open-source EDA, WebGIS, Robot and Servo Motor hardware debugging

English Ability: TOEFL(103)

Awards

2023 Outstanding Graduates of Anhui Province (Top 3%)

2023 Postgraduate Scholarships of UCAS

2024 Postgraduate Scholarships of UCAS