Zhuang Shanning

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Education

Tsinghua University, Beijing, China 09/2024 – Present

PhD student in Robotics & AI, Advised by Prof. Yanan Sui

- Research focus: Reinforcement learning control of musculoskeletal humanoid robots

Tongji University, Shanghai, China 09/2020 – 07/2024

B.Eng in Mechanical Engineering, *GPA:* 90.24%, *Rank:* 5/108

Publications

- Y. Wei, **S. Zhuang**, V. Zhuang, Y. Sui. "Motion Control of High-Dimensional Musculoskeletal Systems with Hierarchical Model-Based Planning", *International Conference on Learning Representations (ICLR)*, 2025. [PDF]
- C. Zuo, G. Lin, C. Zhang, **S. Zhuang**, Y. Sui. "Human sensory-musculoskeletal modeling and control of whole-body movements", *In submission*, 2025. [PDF]

Research Experience

Musculoskeletal Humanoid Control Research 09/2024 – Present

- Scaled RL training to multi-GPU using JAX, achieving 20x throughput improvement over CPU baseline
- Implemented QFlex algorithm using flow matching to mitigate the sample inefficiency in high dimensional action spaces, achieving 2x performance over PPO in 700+ dimensional action spaces
- Improved data collection efficiency by 10x through curriculum learning and quality filtering
- Built modular training framework integrating hyperparameter management, environment simulation, and RL algorithms for reproducible experiments

Technical Skills

- **LLM-Related:** CS336 with hands-on implementation of transformer architectures, training pipelines, and tokenization
- **AI Tools:** Power user of ChatGPT, Claude Code, Cursor for learning, working and coding
- **Machine Learning:** PyTorch, JAX, Reinforcement Learning, model training and evaluation
- **Programming:** Python, C++, Web scraping, Web development, Git, Linux
- **Robotics:** Full-stack robot development including mechanical design (CAD, FEA), electrical design (PCB, embedded systems), and software (ROS, motion planning, control systems)