Steven Gong

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Education

Australian National University (QS TOP 30) Feb.2024 - Nov.2025

M.S. Computing (Advanced), GPA:6.43 / 7.0

Beijing Institute of Technology (Project 985) Sep.2018 - Jun.2022

B.S. Computer Science and Technology

Experience

Shenzhen Yimeizhi Technology Co., Ltd Shenzhen, China Mar.2023 - Dec.2023

Computer Vision Algorithm Engineer HR Manager: Wenxian Gan

• Designed and optimized algorithms for an Automatic Optical Inspection system to detect defects in PCB.

Beijing Institute of Technology Beijing, China Jul.2022 - Jan.2023

Research Assistant Supervisior: Prof. Jianwei Gong

• Conducted research on trajectory prediction and decision-making processes for autonomous vehicles.

ByteDance, Quality Lab Beijing, China Oct.2021 - Feb.2022

Algorithm Engineer Intern Supervisior: Zhao Zhang

• Optimized reinforcement learning algorithms in the software testing tool Fastbot.
• Enhanced test coverage and problem interception rate, significantly improving efficiency and quality.

Publications

- **Leveraging Multi-Stream Information Fusion for Trajectory Prediction in Low Illumination Scenarios: A Multi- channel Graph Convolutional Approach *HaiLong Gong***, ZiRui Li, Chao Lu, GuoDong Du, JianWei Gong, IEEE Transactions on Intelligent Transportation Systems (T-ITS).
- **Towards Online Risk Assessment for Human-robot Interaction: A Data-driven Hamilton-Jacobi-Isaacs Reachability Approach**, ***HaiLong Gong***, ZiRui Li, Chao Lu, JianWei Gong, 26th IEEE International Conference on Intelligent Transportation Systems (ITSC2023).
- **Towards Safe, efficient and Co-operative Decision-making for CAVs in Mixed Autonomy: An Attention-Enhanced Graphic Reinforcement Learning Approach *HaiLong Gong***, ZiRui Li, RunHao Zhou, Qi Liu, Chao Lu, JianWei Gong, The 4th Symposium on Management of Future Motorway and Urban Traffic Systems 2022 (MFTS 2022).
- **Fast and Accurate: Perception System of a Formula Student Driverless Car *HaiLong Gong***, Yunji Feng, TaiRan Chen, ZuoOu Li, YunWei Li, 2022 6th International Conference on Robotics, Control and Automation (ICRCA 2022).
- **Real-time Motion Planning and Control for a Formula Student Driverless Car** TaiRan Chen, ***HaiLong Gong***, XinYu Gao, ChenRui Huang, Xiang Li, ShaoKun Yang, YunJi Feng, Annual Conference of Society of Automotive Engineers of China, 2020.

Skills

- **Programming Languages:** Python, C/C++, Java, Golang
- **High-Performance Computing:** OpenMP, MPI, CUDA, AVX/SSE, Roofline Analysis
- **Performance Optimization:** Memory profiling, Cache utilization, Parallel programming
- **AI & Machine Learning Tools:** PyTorch, TensorFlow, Keras, OpenCV, Scikit-learn
- **Development Tools:** Linux, Git, Docker, CI/CD pipelines, QT, Node.js, RESTful APIs, MongoDB, SQL
- **Languages:** English (Fluent), Mandarin (Native)

Projects

Cloth Simulation with AVX and OpenMP Optimization Sept. 2024 - Oct. 2024

ANU COMP6464 High Performance Scientific Computation Course Project, Instructor: Prof. Haibo Zhang

• Designed and implemented a 2D cloth simulation under gravity, incorporating Hooke's law for elastic interactions and accurate collision detection with a spherical object.
• Corrected velocity components during collisions to ensure realistic physical behavior, integrating damping factors to model friction between the cloth and the sphere.
• Optimized the simulation kernel using SSE/AVX intrinsics, achieving a 50% reduction in force calculation time and improving computational efficiency.
• Parallelized the simulation with OpenMP, employing block-wise distribution and round-robin scheduling, achieving near-linear speedup with up to 24 threads on the Gadi supercomputer.
• Conducted Roofline analysis using Intel Advisor to identify memory-bound and compute-bound regions, optimizing vectorization and parallelization for balanced performance.
• Evaluated performance across different problem sizes, analyzing scalability and bottlenecks, and documenting findings in a detailed technical report with performance data and insights.

Race to the Raft: Game Developing in Java Mar.2024 - June.2024

COMP6710 Structured Programming Course Project, Instructor: Prof. Fabian Muehlboeck

• Conducted thorough analysis and design, creating a comprehensive design document with a detailed sketch of the game architecture, including key Java class declarations and field/method signatures.
• Implemented the game design using object-oriented programming principles in Java, ensuring robust and maintainable code structure.
• Designed a detailed test plan and implemented unit tests to validate functionality and ensure high-quality code.
• Collaborated effectively with teammates using Git for version control, performing regular code reviews to maintain code quality and coherence.

Personal Web Develop and Backend Implementation June.2024 - now

• Employed the Friday Theme framework for agile development of the homepage interface, incorporating features for personal information display, blog management, and project showcasing.
• Designed and implemented RESTful web services and APIs using the Express.js framework, significantly enhancing system interoperability and operational efficiency.
• Utilized MongoDB to track web page visits, daily traffic, and visitor IP addresses, and developed data visualization tools to present access metrics effectively.
• Deployed the application on Microsoft Azure, ensuring scalability, performance, and continuous integration.

Multi-Source Sensor Fusion-based Trajectory Prediction May.2022 - Jun.2023

Instructor: Prof. Jianwei Gong, Prof. Chao Lu, Collaborator: Zirui Li

• Proposed an interactive trajectory prediction model based on multi-stream heterogeneous data fusion to enhance accuracy.
• Developed a novel ST-GCN-based embedding method to generate temporal and spatial features of traffic participants' trajectories and speeds, along with an LSTM-based image feature extraction method for self-adaptive attention capture.
• Implemented a flexible and versatile multi-stream heterogeneous data system.

♡ Honors and Awards

Champion, Formula Student Autonomous China (FSAC), Nation Level 2020
1st Prize, ByteDance Summer Camp, Nation Level 2021
1st Prize, "Century Cup" Extracurricular Academic Competition, School Level 2021
Excellent Oral Presentation, 2022 6th International Conference on Robotics and Machine Vision 2022
2nd Class Scholarship, Beijing Institute of Technology, School Level 2022
3rd Class Scholarship, Beijing Institute of Technology, School Level 2019
3rd Prize, 17th "Century Cup" Competition, City Level 2020
3rd Prize, "Century Cup" Extracurricular Academic Competition, School Level 2021