Shutong Zhang

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Education

Stanford University Sep 2024 - Mar 2026 (Expected)
Master of Science in Computer Science (CGPA: 4.11/4.00) *Palo Alto, CA, US*

University of Toronto Sep 2019 – Jun 2024
Bachelor of Applied Science in Computer Engineering (CGPA: 3.94/4.00) *Toronto, ON, Canada*

Skills

Programming: Python, C/C++, MatLab, Perl, React, TypeScript, NodeJS, PostgreSQL, JavaScript, HTML
Libraries&Tools: Pytorch, Pandas, Scikit-Learn, Flask, Hadoop, AWS, Azure, Slurm, Docker, Isaac Sim, Mujoco

Work Experience

Vector Institute Sep 2023 – Aug 2024
Machine Learning Engineer Intern *Toronto, ON, Canada*

- Proposed a grasp generation pipeline that generates language-guided functional grasps using contact conditioned diffusion model and fine-tuned large language model (LLM) that achieved 2x stability and 32% higher success rate
- Designed an integrated differentiable rendering and simulation pipeline using Pytorch to estimate the hand-object interaction that achieved 50% lower object error and 25% lower hand error than state-of-the-art (SOTA) models
- Applied differentiable physics and position-based dynamics to generate a dataset of one million unique grasps with multi-modal visual input that achieve 10x speed, 10x contact and 2x epsilon quality
- **Technologies**: Python, Numpy, Pytorch, OpenCV, Docker, Scikit-Learn, Isaac Sim

ETH Zürich - Computer Vision Lab May 2023 – Aug 2023
Computer Vision Engineer Intern *Zurich, Switzerland*

- Implemented a deep learning pipeline using Pytorch that transforms daytime images into simulated nighttime images for semantic scene understanding tasks via inverse rendering, improving mIoU of SOTA methods by 4.3%
- Reconstructed 3D scene mesh from depth and normals; rendered nighttime images with albedo, roughness, and probabilistically activated light sources in Blender, achieving a 2x improvement in image realism score
- **Technologies**: Python, Numpy, Pytorch, MatLab, OpenCV, Slurm, Bash, Blender

Intel Corporation May 2022 – Apr 2023
Software Engineer Intern *Toronto, ON, Canada*

- Developed an auto-triage tool using Perl and MySQL to analyze test failures, achieved over 90% accuracy rate
- Refined and enhanced a compile statistic visualization tool using ReactJS and redesigned the system-viewer: A kernel events visualizer of Intel oneAPI FPGA Reports Tool using a React-based graphics engine
- Enabled screenshot test in the CI/CD pipeline that detects illegal frontend changes to improve design integrity
- Ported typed pointers to opaque pointers in the Intel LLVM FPGA compiler codebase
- **Technologies**: C++, Perl, SQL, React, Javascript, GitHub CI/CD, Agile Development, Data Structure

Publications

[1] K. Tzevelekakis, **S. Zhang**, L. Van Gool, C. Sakaridis. Sun Off, Lights On: Photorealistic Monocular Nighttime Simulation for Robust Semantic Perception ; **WACV 2025 Oral**

[2] **S. Zhang**, T. Zhang, J. Cheng, S. Zhou. Who to Blame: A Comprehensive Review of Challenges and Opportunities in Designer-Developer Collaboration; **CSCW 2025**

[3] **S. Zhang***, Y. Qiao*, G. Zhu*, E. Heiden, D. Turpin, M. Lin, M. Macklin, A. Garg. HandyPriors: Physically Consistent Perception of Hand-Object Interactions with Differentiable Priors ; **CVPRW 2023**, **ICRA 2024**

[4] D. Turpin, T. Zhong, **S. Zhang**, G. Zhu, E. Heiden, M. Macklin, S. Tsogkas, S. Dickinson, A. Garg Fast-Grasp'D: Dexterous Multi-finger Grasp Generation Through Differentiable Simulation ; **ICRA 2023**

Selected Projects

Smart Forks-Insight - Capstone Project Sep 2023 – Apr 2024

- Collaborated with a team to develop a fork management Chrome extension using the GitHub API to extract and summarize fork data. The project features a Flask backend, React frontend, and external LLM integration.
- Deployed a pre-trained local pre-processing model to summarize extracted commit messages and code changes, reducing input tokens by 40% thus lowering processing costs
- **Technologies**: Python, Flask, React, HTML/CSS, Docker

Geographic Information System Software Program Jan 2021 – Apr 2021

- Developed a large-scale, Google Maps-inspired application using C++, HTML, CSS, and JavaScript to visualize 35 major cities, incorporating features like public transportation, navigation, and user reviews.
- Implemented Dijkstra, A*, and Simulated-Annealing heuristics for the travelling salesman problem that reduced the shortest path by 33% compared with greedy algorithm and ranked 1 out of 109 in the competition
- Led a cross-functional team of four by distributing tasks, managing project timelines, and ensuring clear communication through regular meetings, while maintaining a collaborative and cohesive team environment.
- **Technologies**: C++, Javascript, HTML/CSS, Data Structure, Algorithm