

Hongyi Sun

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EDUCATION

- **Harvard University** Cambridge, MA
Master of Science - Computational Science and Engineering Sept 2022 - Dec 2023(Expected)
- **University of Toronto** Toronto, ON
Bachelor of Science (Honours) - Computer Science; cGPA: 3.99/4.00 Sept 2017 - Apr 2022
Courses: Computer Vision, Physics-based Simulation, Machine Learning, Deep Learning, Operating Systems

WORK EXPERIENCE

- **Qualcomm** Markham, ON
Software Engineer Intern May 2020 - April 2021
 - Worked in the automotive video team, primarily worked on QNX Hypervisor (with Android GVM) on the latest Qualcomm Automotive Chipsets.
 - Designed and developed features for video drivers that increased their overall performance and added support for new video codec formats to video drivers. Developed a complete unit testing pipeline for video components.
 - Performed more than 40 validations on the video product requirements (decoding, encoding, video pre-processing, etc.), debugged and assessed their performance across various Qualcomm chipsets.
 - Coordinated with different teams and customers on task progresses, tracked and updated the progress on JIRA pages, and updated video validation steps and performance KPIs on team Confluence pages.

RESEARCH EXPERIENCE

- **MIT Research Laboratory of Electronics (RLE)** Cambridge, MA
Research Assistant Sept 2022 - Present
 - Working with professor Sixian You on utilizing masked autoencoders for image completion on fluorescence microscopy images.
- **Computer Systems and Networks Group, University of Toronto** Toronto, ON
Research Assistant May 2021 - Mar 2022
 - Worked with professor Nandita Vijaykumar on accelerating coordinate-based multilayer perceptron networks.
 - Designed a new architecture for coordinate-based neural representations and demonstrated a speedup of up to 3x compared to the baseline model for image, video, and 3D shape representation and rendering tasks. Results have been presented at **ICLR 2022**.
- **Robot Vision and Learning Lab, University of Toronto** Toronto, ON
Research Assistant Jun 2020 - May 2021
 - Worked with professor Florian Shkurti on using a differentiable neural network renderer to create adversarial scenarios for self-driving policies.
 - Train the differentiable neural network renderer using scenes generated by CARLA simulator on Unreal Engine 4.
 - Modified the network to improve its accuracy on city-scaled scenes with dynamic objects.
 - Provided a video demonstration that helped our project to win the **2020 Amazon research award**.

PUBLICATIONS

- [1] CoordX: Accelerating Implicit Neural Representation with a Split MLP Architecture
Ruofan Liang, **Hongyi Sun**, Nandita Vijaykumar. *ICLR 2022*.

PROJECTS

- **Position-based Fluid Simulation:** Implemented a highly realistic physics-based fluid simulation in C++ by utilizing a Position Based Dynamics framework. Used libigl for geometry processing and Eigen for matrix and vector operations.

HONORS AND AWARDS

- NSERC Undergraduate Student Research Award - 2021
- F Ray Irwin Scholarship - 2021
- The Professor William Kingston and Dr John Kingston Scholarship - 2019
- Dean List Scholar - 2018, 2019, 2021, 2022
- The Regents Graduating Scholarship - 2022

SKILLS SUMMARY

- **Languages:** Python, Java, C, C++, JavaScript, Kotlin, Bash, HTML, \LaTeX , CSS, Swift, SQL, Verilog
- **Tools/Other:** OpenCV, TensorFlow, PyTorch, Git, React, NodeJS, Express, NumPy, Selenium, Firebase, MongoDB, PostgreSQL