

Hanchen (Howard) Xiao

CONTACT INFORMATION	1353 Gallery Hill Oakville, ON, Canada L6M2N2	E-mail: howardx@stanford.edu Website: https://howardxiao.ca/
SUMMARY	I am a first-year PhD student at Stanford Computational Imaging Lab, advised by Prof. Gordon Wetzstein. Previously, I was an undergraduate researcher at the Toronto Computational Imaging Group (TCIG), working under Prof. Kyros Kutulakos and Prof. David Lindell. My current research focuses on designing next-generation imaging systems with unseen capabilities.	
EDUCATION	PhD, Electrical Engineering (Ongoing) Stanford University, Stanford, CA, United States Advisor: Prof. Gordon Wetzstein Honours Bachelor of Science (Conferred June 2025) University of Toronto, Toronto, ON, Canada Computer Science Specialist and Mathematics Specialist, GPA: 3.86/4.00	
PUBLICATIONS	[1] Sotiris Nousias*, Mian Wei*, Howard Xiao, Maxx Wu, Shahmeer Athar, Kevin J Wang, Anagh Malik, David A. Barmherzig, David B. Lindell, Kyros Kutulakos <i>Opportunistic Single-Photon Time of Flight</i> IEEE/CVF Conference on Computer Vision and Pattern Recognition, 2025 (oral presentation) [2] Howard Xiao, Anton Izosimov, Boris Khesin <i>Broken Virasoro Groupoid</i> In preparation.	
UPCOMING WORKS	Howard Xiao, Sotiris Nousias, Mian Wei, David B. Lindell, Kyros Kutulakos <i>Single-photon Doppler Lidar</i> (In preparation)	
RESEARCH EXPERIENCE	[1] <i>Ultra-wideband Single-photon Imaging</i> September 2023 – Now Supervisor: Prof. Kyros Kutulakos, Prof. David Lindell Focusing on developing mathematical and signal processing techniques inspired by ultra-wideband Fourier probing to enhance tasks like LiDAR, velocity and distance measurement, and passive imaging, pushing the limits of modern single-photon detectors. [2] <i>Broken Virasoro Groupoid</i> September 2023 – June 2025 Supervisor: Prof. Boris Khesin Conducting research to understand the structure of central extensions of the Virasoro groupoid and algebroid, classify their cocycles and co-adjoint actions, as well as to study the corresponding equations in mathematical physics. [3] <i>Rate of Convergence in Steiner Symmetrizations</i> August 2023 – April 2024 Supervisor: Prof. Almut Burchard During this one-year research course, we explored transformations of convex and non-convex bodies under Steiner symmetrizations, and the rate of convergence of Steiner symmetrizations on different bodies.	
AWARDS	[1] <i>Undergraduate Student Research Awards (USRA) – Natural Sciences and Engineering Research Council of Canada (NSERC)</i>, May 2024 – August 2024 Supervisor: Prof. Kyros Kutulakos, Prof. David Lindell Project title: <i>Ultra-wideband Single-photon 3D Imaging</i>	

Amount: \$7500

- [2] *Undergraduates Student Research Awards (USRA) – Natural Sciences and Engineering Research Council of Canada (NSERC)*, May 2024 – August 2024 (Declined offer)

Supervisor: Prof. Boris Khesin

Project title: *Groupoids in Mathematical Physics*

Amount: \$7500

- [3] *2022 and 2023 Innis College Exceptional Achievement Award – Innis College, University of Toronto*

Amount: \$400

- [4] *2021, 2022 and 2023 Dean's List Scholar – Faculty of Arts & Science, University of Toronto*

- [5] *University of Toronto In-course Scholarship*, September 2021

Amount: \$1500

- [6] *University of Toronto Scholars Program*, September 2020

Amount: \$7500

TALKS	Canadian Undergraduate Mathematics Conference (CUMC) Talk title: <i>Learning the Math Language: Gaining Intuition Behind Analysis</i> Video link here	June 2023
TEACHING	<i>Teaching Assistant, Mathematics Department, University of Toronto, Toronto, ON</i> For three semesters, I worked as a teaching assistant for first-year advanced linear algebra courses at University of Toronto. My responsibilities included leading weekly two-hour tutorials, creating problems and solutions, designing make-up exams, grading assignments, and invigilating exams.	January 2024 – April 2025
EMPLOYMENT	<i>Software Developer Intern, Bell Canada, Mississauga, ON</i> During the 12-month internship, I utilized Python, Ruby, SQL, as well as Ollama and Langchain framework to fine-tune open-sourced large language model into internal document retrieval and code generator tools. I also initiated various projects related to generative AI in daily work tasks.	May 2023 – May 2024
COMMUNITY ENGAGEMENT	<i>Activity Manager, Brighten A Day Toronto, Toronto, ON</i> As the activity manager, I organized fundraising events, including food sales at the University of Toronto, with raised funds going to support five local nursing homes. Additionally, I coordinated a Christmas card writing event that connected students with seniors in long-term care homes, fostering a sense of community and connection.	September 2021 – April 2023