Victor Rong

vrong@cs.toronto.edu | lessvrong.com | victor-rong | victor__rong

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Education

PhD in Computer Science, University of Toronto *Sept 2023 - Ongoing*
Co-advised by David Lindell and Kyros Kutulakos; GPA: **4.0/4.0** Toronto, ON, Canada

MEng in Computer Science, Massachusetts Institute of Technology *June 2022 - June 2023*
Thesis: *How to Pack Anything*; Advised by Frédo Durand; GPA: **5.0/5.0** Cambridge, MA, USA

BSc in Computer Science and Mathematics, Massachusetts Institute of Technology *Sept 2019 - June 2023*
Double Major in CS and Math; Minor in Public Policy; GPA: **4.9/5.0** Cambridge, MA, USA

Selected Publications

A=Alphabetical Ordering, C=Conference, J=Journal, P=Patent, S=In Submission

[S] **Victor Rong**, Jingxiang Chen, Sherwin Bahmani, Kiriakos N Kutulakos, and David B Lindell. (2024). **GStex: Per-Primitive Texturing of 2D Gaussian Splatting for Decoupled Appearance and Geometry Modeling**. *arXiv preprint arXiv:2409.12954*.

[CJ] Qiaodong Cui, **Victor Rong**, Desai Chen, and Wojciech Matusik. (2023). **Dense, Interlocking-Free and Scalable Spectral Packing of Generic 3D Objects**. *SIGGRAPH 2023*.

[P] Qiaodong Cui, Wojciech Matusik, and **Victor Rong**. (2022). **Frequency Domain Spatial Packing for 3D Fabrication**. *United States Patent, US 11,897,203 B1*. Application Date: September 29, 2022. Grant Date: February 13, 2024.

[AC] Mingyang Deng, Yael Kirkpatrick, **Victor Rong**, Virginia Vassilevska Williams, and Ziqian Zhong. (2022). **New Additive Approximations for Shortest Paths and Cycles**. *ICALP 2022*.

Research Experience

Research Intern at Luma AI *June - Aug 2023*
Supervised by Matt Tancik Remote
- Worked on improving geometry extraction from NeRF-based methods
- Implemented post-processing mesh optimization

Software Engineer at Inkbit *June - Dec 2022*
Supervised by Qiaodong Cui and Wojciech Matusik Boston, MA, USA
- Assisted in the research and development of a state-of-the-art 3D packing algorithm
- Proposed and implemented a method based on mesh collision detection that improved packing density
- Improved runtime of our disassembly method using graph algorithms
- Demonstrated how a combinatorial search could improve packing density at a cost to runtime
- Helped write a paper and generate video results for a submission that was accepted to the SIGGRAPH 2023 journal track
- Separately, implemented text engraving on 3D surfaces using mesh geodesics

Theoretical CS Undergraduate Researcher at MIT *Sept - Dec 2021*
Supervised by Virginia Vassilevska Williams Cambridge, MA, USA
- Proposed an additive approximation algorithm for an undirected graph's shortest cycle and proved that it achieved better time complexity than existing algorithms
- Helped in compiling work into a paper that was accepted to ICALP 2022

Graphics and ML Undergraduate Researcher at MIT *March - May 2021*
Supervised by Dima Smirnov and Justin Solomon Cambridge, MA, USA
- Implemented a sketch-to-3D learning pipeline by partitioning 3D shapes of a diverse range of classes into simpler parts and learned patch-based representations for each part

Research Intern at Uber ATG *May - Sept 2020*
Supervised by Siva Manivasagam, Shenlong Wang, and Raquel Urtasun Toronto, ON, Canada
- Implemented both conventional and neural methods for reconstructing and compressing geometries from point clouds generated from LiDAR scans

ML Undergraduate Researcher at MIT-IBM Watson AI Lab *Feb 2020 - May 2021*
Supervised by Tsui-Wei Weng and Luca Daniel Cambridge, MA, USA
- Proposed an algorithm for probabilistic bounds of multilayer perceptron outputs in image classification tasks
- Developed a training pipeline using this algorithm to improve a model's robustness in this setting

Teaching Experience

TA for Algorithm Design at UofT *Jan - April 2023*
- TA for an undergraduate algorithms course (CSC373 Winter 2024, taught by Nathan Wiebe)
- Graded problem sets and wrote solutions for students to review
- Held multiple recitations generally attended by 20 students each week

TA for Algorithm Design at UofT *Sept - Dec 2023*
- TA for a graduate-level algorithms course (CSC2420 Fall 2023, taught by Allan Borodin)
- Graded problem sets and helped verify problem difficulty

TA for Computer Vision at MIT *Feb - May 2023*
- TA for a graduate-level computer vision course (6.8300/1 Spring 2023, taught by Bill Freeman, Vincent Sitzmann, and Mina Luković)
- Graded problem sets and held office hours generally attended by around 10 students each week
- Anonymous evaluations though MIT's official post-course surveys rated me at **6.7/7.0** overall

TA for Linear Algebra at MIT *Sept - Dec 2022*
- TA for an introductory linear algebra course (18.06 Fall 2022, taught by Steven Johnson)
- Designed and taught multiple recitations generally attended by around 20 students each week
- Held office ours and created exam review material for students
- Anonymous evaluations though MIT's official post-course surveys rated me at **6.9/7.0** overall

UA for Differential Equations at MIT *Feb - May 2022*
- Undergraduate assistant for an introductory differential equations course (18.03 Spring 2022, taught by Tristan Collins)
- Held office hours generally attended by 5-10 students each week and designed exam review material for students
- Anonymous evaluations though MIT's official post-course surveys rated me at **6.4/7.0** overall

Leadership Experience

Math Camp Leader and Trainer *2020, 2021, 2024*
- Served as leader for Team Canada at the 2024 International Math Olympiad
- Co-organized two-week long summer camp for IMO Team Canada as well as other national-level high school students
- Created and gave lectures at various national-level math camps

Co-President of HKN Beta Theta Chapter (HKN MIT) *June 2022 - May 2023*
- Led MIT's honor society for EECS undergraduates and revitalized the organization after a period of relative inactivity due to remote semesters
- Organized tutoring services which matched upper-level student tutors to tutees, and enabled over 1000 hours of tutoring in total
- Maintained back-end and learned SQL and Docker in order to operate HKN MIT's online services
- Helped begin a merchandise initiative that sold over 300 articles of clothing with custom-made designs pertaining to MIT EECS
- Inducted over 70 new members into the chapter based on academic merit and community service

Honors and Awards

Wolfond Fellow *2023 - 2024*
- Graduate school fellowship worth **5 000 CAD** awarded to students in the Department of Computer Science at UofT on the basis of academic merit

Akamai Award *2019*
- College scholarship worth **10 000 USD** awarded for placing third at the 2017 USA Math Olympiad

Various National and International Achievements in Math Competitions *2017 - 2022*
- Putnam Competition Top 20 in 2019, 2021, and 2022 (Putnam was not officially held in 2020)
- International Math Olympiad Silver Medallist (Top 25%) in 2017 and 2018; Gold (Top 9%) in 2019
- USA Math Olympiad Winner (Top 12) in 2017, 2018, and 2019; Third Place in 2017

Various National and International Achievements in Competitive Programming *2018 - 2019*
- International Olympiad in Informatics Silver Medallist (Top 25%) in 2018 and 2019
- USA Computing Olympiad Platinum Division (highest division) in 2018 and 2019
- Canadian Computing Olympiad Gold (Top 4) in 2018 and 2019