Chirantan Mukherjee

CONTACT INFORMATION

ORCCA Lab
Department of Computer Science
The University of Western Ontario

⬈ csd.uwo.ca/∼cmukher/
✉ cmukher@uwo.ca

EDUCATION

The University of Western Ontario, Canada

Ph.D. in Computer Science, May 2024–present.

- Advisor: Dr. Marc Moreno Maza.
- Fast track to Ph.D. from M.Sc. in Computer Science, Sep. 2023–Apr. 2024.

Ph.D. coursework in Mathematics, Sep. 2022–Aug. 2023.

University of Trento, Italy

M.Sc. in Advanced Mathematics, Sep. 2019–Mar. 2022.

- Dissertation: Complete Segal Spaces as a model of Higher Categories.
- Advisor: Dr. Nima Rasekh.

Erasmus+ Study in University of Warsaw, Poland.

Institute of Mathematics and Applications, India

B.Sc. (Honors) in Mathematics and Computing, Aug. 2015–Apr. 2018.

- Dissertation: Set Theory and Foundation of Mathematics.
- Advisor: Dr. Shashi Mohan Srivastava.

WORK EXPERIENCE

Maplesoft Incorporation, Canada

Internship, Jun. 2024–present.

- Advisor: Dr. Jürgen Gerhard.
- Implemented a new Fourier-Motzkin Algorithm for finding projections of a system of linear inequalities in C++ and Maple for the RegularChains library.
- Implemented the Double Description Method for finding Vertices and Rays in C++ and Maple for the PolyhedralSets library.
- Wrote a connector which gives Maple programs access to external C++ data structures.

The Society of Graduate Students, Canada

Ombudsperson, Sep. 2023–Apr. 2024.

- Ensuring Fairness and Resolution for Graduate Students through Conflict Resolution and Mediation.
- Enhancing Accountability and Policy Development for Fairness and Resolution in Graduate Education.

TECHNICAL SKILLS

Languages:	C, C++, Cilk, CUDA, GAP, Java, Julia, Python, SageMath, SQL.
Software:	Google Suites, LaTeX, Maple, Mathematica, Microsoft Office.

PUBLICATIONS

Accepted

TBA 2025 — Chirantan Mukherjee, Nima Rasekh. *Twisted Arrow Construction for Segal Spaces.* The Graduate Journal of Mathematics. arXiv:2203.01788.

Submitted

Jul. 2024 — Chirantan Mukherjee. *A New Algorithm for Computing Integer Hulls of 2D Polyhedral Set.* Maple Transactions, under review.

AWARDS AND GRANTS	2024–2025	*Western Graduate Funding*, The University of Western Ontario, Canada, $26,799.12.
	2024	*Second Place for Best Business Plan*, Graduate Students Innovation Scholars 2024, Canada.
	2023–2024	*Western Graduate Funding*, The University of Western Ontario, Canada, $31,950.46.
	2022–2023	*Western Graduate Funding*, The University of Western Ontario, Canada, $28,100.
	2021–2022	*Thesis Research Abroad*, University of Trento, Italy, €2,700.
	2020–2021	*Erasmus+ Grant*, Italian Erasmus+ Agency, Italy, €6,207.
	2015–2018	*National Board for Higher Mathematics Scholarship*, Government of India, India, ₹2,500/month.

TEACHING	**Courses**	**The University of Western Ontario**, Canada
	Winter 2025	*CS 3350, Computer Organization*, Teaching Assistant.
		Preparing assignments and exercises, and holding weekly office hours.
	Fall 2024	*CS 3342, Organization of Programming Languages*, Teaching Assistant.
		Preparing assignments and exercises, and holding weekly office hours.
	Winter 2024	*CS 2214, Discrete Structures for Computing*, Teaching Assistant.
		Teaching, preparing assignments and exercises, and holding weekly office hours.
	Fall 2023	*CS 2214, Discrete Structures for Computing*, Teaching Assistant.
		In charge of teaching a class of 226 students and holding weekly office hours.
	Summer 2023	*Math 1600, Linear Algebra I*, Teaching Assistant.
		Managing two classes of 45 students each solving weekly problems and grading assignments.
	Winter 2023	*Math 1600, Linear Algebra I*, Teaching Assistant.
		Managing a class of 41 students helping them solve weekly problems, conducting bi-weekly quizes and grading them.
	Fall 2022	*Math 1228, Methods of Finite Mathematics*, Teaching Assistant.
		Proctoring and marking tests throughout the term.
	Projects	**The University of Western Ontario**, Canada
	Fall 2022	Sterling Ebel. *The Yoneda Lemma*. Directed Reading Program.
	Other	**The University of Western Ontario**, Canada
	2022–2023	*Math-Physics Accelerator Help Centre*
		Duties both in-person and virtual help centre.
		Institute of Mathematics and Applications, India
	Jun. 2017	*Regional Mathematical Olympiad Training Camp*
		Train junior mathematical olympiad 2016 awardees for mathematical olympiad.
	Jun. 2017	*Training Camp for Pathani Samanta Mathematics Scholarship*
		Nurturing of talents in mathematics from rural India.
	May 2016	*Training Camp for Pathani Samanta Mathematics Scholarship*
		Nurturing of talents in mathematics from rural India.
	2015–2018	*Sunday Morning Problem Solving Classes*
		Interactive classes for school children, with emphasis on children from vernacular schools.

TALKS	Nov. 2024	*Fourier-Motzkin Elimination using Saturation Matrix*, Maplesoft, Canada.
	Jul. 2024	*A New Algorithm for Computing Integer Hulls of 2D Polyhedral Sets*, Lalo 60, Canada.
	Jun. 2024	*Using Saturation Matrix to Efficiently Remove Redundant Inequalities*, Maplesoft, Canada.
	Jun. 2024	*The Polyhedral Model*, Distributed and Parallel Systems, The University of Western Ontario, Canada.
	Apr. 2024	*The Delinearization of C programs*, UWORCS 2024, The University of Western Ontario, Canada.
	Jul. 2023	*The Quickhull Algorithm for Higher Dimensional Convex Hulls*, Mathematical Computation, The University of Western Ontario, Canada.
	May 2023	*Twisted Arrow Construction for Segal Spaces*, Ottawa Mathematics and Statistics Conference, University of Ottawa, Canada.
	Mar. 2023	*Model Structure on Simplicial Categories*, Graduate Student Seminar, The University of Western Ontario, Canada.
	Jul. 2022	*Complete Segal Spaces as a Model of Higher Categories*, GROOT Summer Seminar 2022, University of Notre Dame, US.
	Jun. 2022	*Higher Category Theory*, Indian Statistical Institute, Kolkata, India.
	Mar. 2021	*The $Conf_2$ space of rational homology of S^3 and propagators*, University of Warsaw, Poland.
	Jan. 2021	*Differentiable manifolds and forms, de Rham cohomology*, University of Warsaw, Poland.
	Dec. 2020	*Products and cochains of equivariant cohomology theories*, University of Warsaw, Poland.
	Nov. 2020	*Polish spaces*, University of Warsaw, Poland.

INTERNSHIPS AND RESEARCH SCHOOLS	2024	*The Graduate Student Innovation Scholars 2024*, The University of Western Ontario, Canada, $500. Teach graduate students how to generate value from a research technology.
	2022	*HoTTEST Summer School 2022*, The University of Western Ontario, Canada. Introduction to homotopy type theory and formalization.
	2022	*Higher Category Lecture*, Australian National University, Australia.
	2021	*Masterclass on Topological Field Theories and Factorization Homology*, University of Copenhagen, Denmark, €336.07 (University of Copenhagen) + €469.69 (University of Trento).
	2021	*EPFL Topology Seminar Spring 2021*, EPFL, Switzerland. Seminar on algebraic topology and category theory.
	2021	*Intensive Research Programme: Higher Homotopical Structures*, CRM, Spain. Development of higher categorical tools for theory and computations in algebraic K-theory and related theories.
	2020	*Scuola Matematica Interuniversitaria*, University of Perugia, Italy.
	2017	*Summer Research Programme*, Institute of Mathematical Sciences, India, ₹11,000.
	2017	*Project on basic set topology*, Indian Statistical Institute, Kolkata, India.