

# ALEX KAZACHEK

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## EDUCATION

### University of Western Ontario

2019 – 2023 (*Projected*)

HBSc in Mathematics & Data Science.

GPA of 3.91.

## AWARDS

### NSERC USRA

2021 *Summer*

### Cecil G. Gracey Scholarship

2021 *Winter*

### Borwein Memorial Prize

2020 *Winter*

### Dean's Honour Roll

2019 & 2020 *School Years*

### Western Scholarship of Excellence

2019 *Fall*

## SKILLS

### Programming

Analysing data with Python, specifically Turi Create & NumPy.

Implementing cryptographic protocols with Rust.

Creating static web sites using React.js.

### Design

Typesetting with  $\text{\LaTeX}$ .

Animating math with TikZ and Manim.

Recording and visualizing data with Jupyter notebooks and Matplotlib.

### Languages

Russian (conversational fluency).

Japanese (beginner).

## ACADEMICS

### Directed Reading Program

2020 *Fall & Winter*

Studied differential topology under a graduate student, primarily reading Guillemin & Pollack.

Presented on the role of transversal intersections of rays and hypersurfaces in the Jordan-Brouwer separation theorem.

### CUMC 2021 Student Talk

2021 *Summer*

*Title* A mathematical definition of entanglement and its measurement.

*Modified Abstract* Entangled states are formalized as operators over the tensor products of Hilbert spaces. On certain states, known as pure, the level of entanglement may be measured by entanglement entropy. This value may be extended to all states by the convex roof construction, yielding entanglement of formation.

### Summer of Math Exposition 2021 Entry

2021 *Summer*

Co-created animated video with Jacqueline Doan, geometrically motivating and building intuition for the spectral theorem for normal operators.

## WORK EXPERIENCE

### University of Western Ontario | Research Assistant

2021 *Summer*

Performed research in quantum state geometry and information theory, supervised by Dr. Tatyana Barron and funded by NSERC.

## CLUBS & COMMITTEES

### Canadian Undergraduate Mathematics Conference | Committee Member

2021 *Summer*

Created new website for this and forthcoming CUMCs. Implemented desktop and mobile support, and bilingual localization (English & French).

Organized the career and mathematical communication panels, as well as the Lean and Beamer workshops.

2020 *Summer*

Responsible for the software to rapidly move the conference online due to Covid-19.

Organized the career panel.

### Math Club at Western | VP Academics

2020 & 2021 *School Years (on-going)*

Launched biweekly mathematics contests for undergraduate students, and helping write and grade these contests.

Introduced student seminars, an opportunity for undergraduate students in mathematics or related disciplines to share their independent studies and projects.