

# Víctor Hugo Almendra Hernández

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<https://victoralmh.github.io>

## RESEARCH INTERESTS

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Theoretical computer science, with broad interests in combinatorial and topological/geometric ideas.  
High dimensional expansion, complexity theory, error correction, pseudorandomness, sampling algorithms.

## EDUCATION

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- 2022 -        **University of Chicago**  
Ph.D. in Mathematics  
Advisor: Madhur Tulsiani
- 2022 - 2023   **University of Chicago**  
M.S. in Mathematics
- 2017 - 2022   **Universidad Nacional Autónoma de México**  
B.Sc. in Mathematics  
Thesis: *On homology and cohomology of braid groups.*  
Advisor: Rita Jiménez Rolland

## PUBLICATIONS

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### Research

- V.H. Almendra-Hernández, G. Ambrus, M. Kendall. *Quantitative Helly-type theorems via sparse approximation*. Discrete & Computational Geometry (2022), 1-8.
- V.H. Almendra-Hernández, L. Martínez-Sandoval. *On prescribing total orders and preorders to pairwise distances of points in Euclidean space*. Computational Geometry: Theory and Applications, Vol. 107, 2022.

### Expository

- V.H. Almendra-Hernández, J. A. Gómez Ortega. *Basic properties of medians* (Spanish). Tzaloa: Magazine from the Mexican Mathematical Olympiad, vol. 2020-1. 2020. pp. 1-11.
- V.H. Almendra-Hernández. *The Chinese Remainder Theorem, a powerful tool* (Spanish). Tzaloa: Magazine from the Mexican Mathematical Olympiad, vol. 2019-4. 2019. pp. 1-10.

## AWARDS

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- **Neubauer Fellowship**, 2022-2026, University of Chicago.
- **Honorable Mention at the Sotero Prieto Award**, for best bachelor thesis in mathematics, 2023, Mexican Mathematical Society.
- College competitions: **Mexican Regional of International Collegiate Programming Contest** 2019, 2021 (Fourth and Second place, selected for the 2021, 2022 World Finals), **Iberoamerican Mathematical Competition for Universities** 2018 (Silver medal).
- Math Olympiads: **International Mathematical Olympiad** 2016 (Silver medal), **Centroamerican and Caribbean Mathematics Olympiad** 2015 (Gold medal), **Romanian Masters in Mathematics** 2017 (Honorable Mention), **Iberoamerican Mathematical Olympiad** 2016 (Silver medal).

## MENTORING AND TEACHING

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### University of Chicago:

- Spring 2024    College Fellow for MATH 16310 – Honors Calculus III (IBL).  
Winter 2024    College Fellow for MATH 16210 – Honors Calculus II (IBL).  
Autumn 2023   College Fellow for MATH 16110 – Honors Calculus I (IBL).

## Universidad Nacional Autónoma de México

Fall 2020 Teaching Assistant for Discrete mathematics for bachelor's program in Data Science.

## Mentoring

2020 - 2021 Coach in combinatorics for the teams representing Mexico in international Olympiads.

2017 - 2021 Coach for the teams of the Mexico City Mathematical Olympiad.

## TALKS

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- Algebraic and topological properties of braid groups (Spanish), 54 National Congress of the Mexican Mathematical Society, Fall 2021.
- On prescribing total orders and preorders to pairwise distances of points in Euclidean space, XIX Spanish Meeting on Computational Geometry, Summer 2021.
- (Joint with M. Kendall) Quantitative Helly-type theorems via sparse approximation, Young Mathematicians Conference, hosted online by Ohio State University, Summer 2021.
- On prescribing total preorders and linear orders to pairwise distances of points in Euclidean space (Spanish). XXXVI Colloquium Víctor Neumann-Lara in graph theory, combinatorics and its applications, March 2021.

## EXPERIENCE

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### Research

**Budapest Semesters in Mathematics REU (online)**, Summer 2021.

Project: Quantitative Helly-type results.

Supervisor: Gergely Ambrus.

**XXX Summer of Scientific Research**, by the Mexican Academy of Sciences, Summer 2020

Project: An introduction to fixed point metric theory in Banach spaces.

Supervisor: Berta Gamboa de Buen.

### Industry

**Software Engineer Intern, Facebook**, Menlo Park Office, Summer 2019.

## SERVICE

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| 2021        | Organizing Committee of the Discrete and Computational Geometry Workshop.<br>Within the National Computing Meeting 2021, by the Mexican Society of Computer Science. |
| 2019 - 2021 | Member of the National Committee of the Mexican Mathematical Olympiad.<br>Helped with proposal and selection of problems for the national contest.                   |
| 2019 - 2020 | Editorial Committee of Tzaloa, a magazine from the Mexican Mathematical Olympiad.  |