

## EDUCATION

### Carnegie Mellon University, School of Computer Science

Pittsburgh, Pennsylvania, US

Ph.D. in Machine Learning

2023-present

### Pontifical Catholic University of Chile, Institute for Mathematical and Computational Engineering

Santiago, Chile

Master of Science in Engineering

2023

Advisor: Prof. Cristobal Guzman

Thesis: "Stochastic first-order methods for differentially private machine learning"

Graduated with Maximum Distinction

Bachelor of Science in Engineering

2021

Major: Math for Data Science. Minor: Math for Theory of computation.

Graduated with Distinction

## PUBLICATIONS

1. **Tomás González**, Cristóbal Guzmán and Courtney Paquette, "Mirror Descent Algorithms with Nearly Dimension-Independent Rates for Differentially-Private Stochastic Saddle-Point Problems". Conference on Learning Theory (COLT) 2024.
2. Raman Arora, Raef Bassily, **Tomás González**, Cristóbal Guzmán, Michael Menart, and Enayat Ullah, "Faster Rates of Convergence to Stationary Points in Differentially Private Optimization". International Conference in Machine Learning (ICML) 2023.

## RESEARCH EXPERIENCE

### Google Deepmind

Montreal, Quebec, Canada

Student Researcher, Statistical Learning and Optimization team

Sep 2022 - Apr 2023

Supervisors: Courtney Paquette and Fabian Pedregosa.

Research: A Mirror Descent Method for Differentially Private Stochastic Saddle-Point Problems in  $\ell_1$  geometry.

### Pontifical Catholic University of Chile

Santiago, Chile

Undergraduate Research Assistant

2019, 2021

Supervisor: Prof. Cristobal Guzman

Research: Non-Euclidean Differentially Private Stochastic Convex Optimization (2021)

Research: Sequential Games for Dynamic Inspection Problems (2019)

## FELLOWSHIPS AND AWARDS

- Graduate Fellowship, Machine Learning Department, School of Computer Science, Carnegie Mellon University (2023).
- Best Student Award, Institute for Mathematical and Computational Engineering, Pontificia Universidad Catolica de Chile (2023).
- Best Student in Mathematics Award (out of 750 students), Instituto Nacional High School (2016).
- High School Mathematical Olympiads:
  - International Mathematical Olympiad (IMO): Honoric Mention (Hong Kong, 2016).
  - Iberoamerican Mathematical Olympiad: Honoric Mention (Puerto Rico, 2015).
  - Southern Cone Mathematical Olympiad: Bronze Medal (Chile, 2015).
  - Chilean Mathematical Olympiad: Gold medal (2014), Silver medal (2015, 2013), Bronze medal (2016).

## TALKS

1. "Differentially Private Stochastic Saddle-Point Problems in  $\ell_1$  geometry", SIAM Conference on Optimization (OP23), June 2023.
2. "Differentially Private Statistical Synthetic Data Generation", Tea Talks, Google Brain, January 2023.
3. "Differentially private stochastic non-convex optimization", Random Matrix Theory + Optimization + Machine Learning seminar at McGill University, October 2022.
4. "Differentially private stochastic non-convex optimization", International Conference on Continuous Optimization (ICCOPT), July 2022.
5. "Differentially private stochastic non-convex optimization", Algorithms, Combinatorics, Game Theory and Optimization seminar at University of Chile, July 2022.

# EMPLOYMENT

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| <b>Perceptron</b>  | Santiago, Chile     |
| Data Science Intern  | May 2022 - Jul 2022 |
| <b>Pontifical Catholic University of Chile</b>   | Santiago, Chile     |
| Teaching assistant of undergraduate courses  | 2018-2022           |
| <div>1.(Head teaching assistant) Probability and algorithms (2021)</div> <div>2.(Grading and teaching) Linear algebra (2018, 2019, 2022)</div> <div>3.(Teaching) Discrete mathematics (2021)</div> <div>4.(Grading) Discrete mathematics (2019, 2020)</div> <div>5.(Grading and teaching) Calculus II (2020)</div> |                     |
| Teaching assistant of postgraduate courses   | 2021-2022           |
| <div>1.(Grading) Visual recognition (2021)</div> <div>2.(Grading) Relational and reinforcement models (2021, 2022)</div>   |                     |

# SERVICE

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- Reviewer for the Optimization for Machine Learning Workshop at NeurIPS (2022, 2023).
- Math tutor at 'Instituto Nacional' High School in . In charge of preparing a group of 25 high school students to participate in math olympiads at a national and international level.

Last update: May, 2024.