

Carlos Miguel Soto, Researcher & Software Engineer

Languages: Spanish (native) English (fluent, B2) Portuguese (intermediate)

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Education

- **MS in Computer Science** at *University of Buenos Aires* (Expected Graduation: Dec 2024)
- **MS in Mathematics** at *University of Buenos Aires* (Expected Graduation: Oct 2024)

Research

Kapow Group at *University of Buenos Aires*

- Optimal (binary case) and near optimal (general case) minimum discrepancy bounds for de Bruijn sequences and efficient generation of said minimal sequences: [arXiv 2407.17367]
- Ring-theoretic methods for counting 2-factors of de Bruijn graph generated by affine methods. Published in Discrete Applied Mathematics: [arXiv 2308.16257]

Lorel Group at *University of Buenos Aires*

- Correspondence between linear maps and a computationally equivalent programs in linear logic.
- Characterization of semimodules arising from denotational semantics of linear lambda calculi.

Work Experience

Lead Backend Engineer at *Modo* (via *Toptal*), 2021-2024

- Developed media aggregation platform for email and cloud storage providers with **GoLang + MongoDB + MySQL**
- Wrote benchmarks for critical user-facing APIs and improved their latency by 15x
- Implemented migration protocols to efficiently transform the data representation of the database to improve performance and add features
- Created cohesive tooling repo used across the company to improve development experience and onboarding, supporting 35+ unique commands

Technical Consultant at *University of San Martin*, 2019-present

- Managed onsite and online contests for the Argentinian high-school Informatics Olympiad with 300+ concurrent contestants
- Developed the **GoLang + PostgreSQL** backend for the Argentinian Online Judge based on the IOI Contest Management System
- Standardized the problemset preparation format and automated problemset upload, reducing contest preparation time by several hours
- Coached the 2023 and 2024 Argentina Team for the International Olympiad in Informatics

Awards

- **International Olympiad in Informatics:** Gold Medal (2018), Silver Medal (2019)
- **International Collegiate Programming Contest:** World Finals Latin American Champions (2020, 2023), Latin American Regional Champions (2020, 2022, 2023)
- **International Mathematics Olympiads:** Honourable Mention (2016), Bronze Medal (2018)
- For a complete list of awards, see carlos-soto.dev/#awards

Technical Experience

- **Languages:** C++ (5 years), GoLang (3 years), Python (3 years)
- **Databases:** PostgreSQL (4 years), MongoDB (2 years), MySQL (2 years)
- **Standards:** IMAP (2 years), OAuth (2 years)