

BERNARDO SUBERCASEAUX

✉ bersub@cmu.edu [bsubercaseaux.github.io](https://github.com/bsubercaseaux)

EDUCATION

Carnegie Mellon University, PA, United States
5th PhD student, advised by Marijn J. H. Heule.

August 2021 - (expected) August 2026

University of Chile, Chile

March 2014 - December 2020

Master in Computer Science (GPA 7.0/7.0), under the supervision of Pablo Barceló and Jorge Pérez.

Double Bachelor in Engineering and Computer Science (GPA 7.0/7.0), 2019.

1st place in Latin American Contest of Master theses in Artificial Intelligence IEEE LA-CCI.

CentraleSupélec (ex École Centrale Paris), France

September 2016 - June 2018

Bachelor + Master in Engineering - Computer Science (GPA 3.58/4.00)

Received the Eiffel Excellence Scholarship from the French government.

PUBLICATIONS

30. **JAIR 2025** (journal version) *“On Computing Probabilistic Explanations for Decision Trees”*, with M Arenas, P. Barceló, A. Kozachinskiy, and M. Romero.
29. **PODS 2025** (**Distinguished paper award, invited to special issue of TODS**), *“Explaining k -Nearest Neighbors: Abductive and Counterfactual Explanations”*, with P. Barceló, A. Kozachinskiy, M. Romero, and J. Verschae.
28. **ModRef 2025**, *“Asymptotically Smaller Encodings for Graph Problems and Scheduling”* (single author).
27. **CICM 2025**, *“Automated Symmetric Constructions in Discrete Geometry”*, with L. Qian, and M. Heule.
26. **CADE 2025**, *“Unfolding Boxes with Local Constraints”*, with L. Qian, E. Wang, and M. Heule.
25. **INFOCOM 2025**, *“Latency Guarantees for Caching with Delayed Hits”*, with K. Gurushankar, and N. Singer.
24. **AAAI 2024**, *“Probabilistic Explanations for Linear Models”* with M. Arenas and K. Meel.
23. **CG 2024**, *“A Mathematical Analysis of PlaceIt: A Game of Perfect Online Sorting”*, with P. Cuevas-Ruiz, and C. Chock.
22. **KR 2024**, *“A Uniform Language to Explain Decision Trees”*. with M. Arenas, P. Barceló, J. Caraball, and D. Bustamante.
21. **arXiv preprint 2024**, *“A Demigod’s Number for the Rubik’s Cube”*, with A. Merino.
20. **CICM 2024** (**Best paper award runner-up**), *“Automated Mathematical Discovery and Verification: Minimizing Pentagons in the Plane”*. with J. Mackey, M. Heule, and R. Martins.
19. **ITP 2024**, *“A Formal Verification of the Empty Hexagon Number”*. with W. Nawrocki, J. Gallicchio, C. Codel, M. Carneiro, and M. Heule.
18. **arXiv preprint 2024**, *“Pentagon Minimization without Computation”*, with J. Mackey.
17. **LPAR 2024**, *“Sometimes Hoarding is Harder than Cleaning: NP-hardness of Maximum Blocked-Clause Addition”* (single author).
16. **FUN 2024**, *“PackIt! Gamified Rectangle Packing”*. with T. Garrison and M. Heule.
15. **NAW 2024**, *“A proof long enough to stump Leonhard Euler”*. with M. Heule.
14. **LPAR 2023** (**Best paper award**), *“Toward Optimal Radio Colorings of Hypercubes via SAT-solving”*. with M. Heule.

13. **TACAS 2023** (**Best paper award nomination, invited to special issue of JAR**), *“The Packing Chromatic Number of the Infinite Square Grid is 15”*. with M. Heule.
12. **TCS 2022** (journal version) *“On the expressiveness of Lara: A proposal for unifying linear and relational algebra”*, with P. Barceló, N. Higuera and J.Pérez.
11. **SAT 2022**, *“The Packing Chromatic Number of the Infinite Square Grid is at Least 14”*, with M. Heule.
10. **NeurIPS 2022**, *“Augmenting Online Algorithms with ε -Accurate Predictions”*. with A. Gupta, D. Panigrahi and K. Sun.
9. **NeurIPS 2022**, *“On Computing Probabilistic Explanations for Decision Trees”*. with M. Arenas, P. Barceló, and M. Romero.
8. **FUN 2022**, *“Wordle is NP-hard”*. with D. Lokshtanov.
7. **NeurIPS 2021** (**Spotlight, < 3%**), *“Foundations of Symbolic Languages for Model Interpretability”*. with M. Arenas, D. Baez, P. Barceló, and J. Pérez.
6. **NeurIPS 2020**, *“Model Interpretability through the lens of Computational Complexity”*. with P. Barceló, M. Monet and J. Pérez.
5. **AFCI@NeurIPS 2020**, *“Foundations of Languages for Interpretability and Bias Detection”*. with P. Barceló and J. Pérez.
4. **ICDT 2020**, *“On the Expressiveness of LARA: A Unified Language for Linear and Relational Algebra”*. with P. Barceló, N. Higuera and J.Pérez.
3. **FUN 2021**, *“The Computational Complexity of Evil Hangman”*. with J. Barbay.
2. **DEEM 2019 & AMW 2019**, *“Expressiveness of Matrix and Tensor Query Languages in terms of ML Operators”*. with P. Barceló, N. Higuera and J.Pérez.
1. **IOI Journal 2016**, *“Wavelet Trees for Competitive Programming”*. with R. Castro, N. Lehman and J. Pérez.

RESEARCH INTERNSHIPS

- **Amazon**, Automated Reasoning Group, Applied Scientist Intern, supervised by Mike Whalen (June 2024 - August 2024)
- **Amazon**, Automated Reasoning Group, Applied Scientist Intern, supervised by Mike Whalen (May 2023 - August 2023)

SOFTWARE ENGINEERING EXPERIENCE

- **Facebook**, CA, Software Engineering Intern (July 2019 - September 2019)
- **The Dog Company**, Part time Software Engineer (March 2018 - December 2018)
- **kipu**, Software Engineering Intern (July 2017 - September 2017)

TEACHING EXPERIENCE

TA: *Logic and Mechanized Reasoning, Undergraduate Quantum Computation, Complexity and Computability, Design and Analysis of Algorithms, Discrete Math, Theory of Computation, Introduction to Programming, Algorithms and Data Structures, Databases, Programming Languages, and Workshop for Competitive Programming.*

SKILLS

Programming Skills C, C++, Java, Python, Racket, SQL, Javascript (NodeJS, React)