

JONATHAN PRIETO-CUBIDES

Experienced in Functional Programming, Formal Methods, Math Research, and Data Science

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With over seven years of experience as a research engineer, I have developed a diverse skill set specializing in mathematical conceptualization, research, and product development across various technologies and domains. My proven track record includes research projects and products such as academic papers, code implementation, contributions to compilers, more recently, the Juvix programming language, and machine learning applications to text data mining algorithms in full-text search engines. Additionally, I have experience in automatic theorem prover integration tooling, formal verification in languages such as Agda and Isabelle/HOL, and imputation algorithms for missing values using rough set theory. In terms of programming, I am most familiar with Python, Haskell, TypeScript, Julia, and Mathematica. I have extensive experience in high-quality, cross-disciplinary team collaborations and have often taken on natural leadership roles.

Soft Skills: Adaptability, learning potential, teamwork, flexibility, responsibility.

WORKING EXPERIENCE

- **Research & Development Engineer, HeliAx AG.**
Jan 2023 - Present. Remote.
Specification & Anoma Research Topics' Editor
 - <https://anoma.github.io/nspec/>
 - <https://anoma.net/blog/anoma-research-topics-art>
 - <https://art.anoma.net>
- **Compiler Engineer & Product Lead, HeliAx AG.**
Mar 2022 - Dec 2023. Remote.
Juvix Programming Language and Related Compiler Stack Projects
 - <https://docs.juvix.org>
 - <https://github.com/anoma/juvix>
- **Researcher, HeliAx AG.**
Mar 2022 - Dec 2023. Remote.
Compiler Team Member (part-time)
- **Teaching assistant, Department of Informatics, University of Bergen**
2018-2021. Bergen, Norway.
Master courses: Models of Computation, Concurrent Programming, Introduction to Logic, Software Engineering
- **Young Research Assistant, Department of Mathematics, Universidad EAFIT**
2016-2017. Medellín, Colombia.
Contributed to the Apia Haskell project and developed a tool called Online-ATPs.
- **Lecturer. Instituto Tecnológico Metropolitano.**
July 2016 - Dec 2016. Medellín, Colombia.
Undergraduate courses: Linear Algebra, Linear Programming and Algebra
- **Machine Learning Engineer, Observatorio de Tierras.**
2014 - 2016. Bogotá, Colombia.
Developed ML algorithms and text data mining tools.
- **Lecturer, Universidad Sergio Arboleda**
2012-2014. Bogotá, Colombia.
Undergraduate courses: Algorithms I-II, Discrete Mathematics
- **Full-stack Python Developer, Vanitech.**
2012. Bogotá, Colombia.
Developed the booking platform and landing page.
- **Software Developer, Scripta Software.**
2009. Bogotá, Colombia.
Implemented the RSA algorithm for a C# .NET API to serve encryption/decryption services integrated into a financial tool.

INTERESTS

Formal methods, mathematical logic, algorithm design, formal verification, software development, NLP, ML.

TECHNICAL SKILLS

I have experience programming in Python, Mathematica, Agda, Haskell, TypeScript, Java, C, and C++. I am also proficient with tools such as Git, Docker, and LaTeX. Additionally, I have contributed to open-source projects and possess practical experience with CI/CD pipelines. Some of my coding projects are available on my GitHub profile: [jonaprieto](#).

LANGUAGES

- **Spanish:** Native proficiency
- **English:** Professional working proficiency
- **Norwegian:** Certificate A2-B1

EXTRA COURSES

- **Parallel, Concurrent, and Distributed Programming (Specialization of three courses in Java)**, offered by Rice University on Coursera, 30th September 2020
- **Algorithmic Toolbox**, offered by UC San Diego, HSE on Coursera, 20th November 2016

REFERENCES

- **Benjamin Chetioui.** Google Tech Lead & PhD Candidate in Computer Science at UiB. Benjamin.Chetioui@uib.no
- **Ivan Felipe Rodríguez.** Ph.D. Student in Neuroscience at Brown University. ifelipe.rodriguez@hotmail.com
- **Camilo Rodríguez Garzón.** Senior Software Developer at Talabat. cam_rod@hotmail.com
- **Andrés Sicard-Ramírez.** Associated Prof. at Universidad EAFIT. asr@eafit.edu.co

EDUCATION

- **PhD** in Computer Science, Informatics, ICT Research Group, University of Bergen (2018 - 2023), Bergen, Norway. Defended on December, 2024. Thesis title: "*Investigations into Graph-Theoretical Constructions in Homotopy Type Theory*". Supervisors: Håkon R. Gylterud and Marc Bezem.
type theory, logic, algorithms, graph theory, category theory
- **M.Sc.** in Applied Mathematics - Logic and Algorithms, School of Sciences, Universidad EAFIT (2016 - 2017), Medellín, Colombia. Thesis title: "*Proof-Reconstruction in Type Theory for Propositional Logic*". Supervisor: Andrés Sicard-Ramírez.
- **B.Sc.** in Mathematics, Faculty of Engineering, Universidad Sergio Arboleda (2007 - 2013), Bogotá, Colombia. Thesis title: "*Introduction to Elliptic Curves*". Supervisor: Hermés Martínez.

PUBLICATIONS

- **Prieto-Cubides, Jonathan** and Håkon Robbestad Gylterud (2024). On planarity of graphs in homotopy type theory. *Mathematical Structures in Computer Science*, pp. 1–41. DOI: 10.1017/S0960129524000100.
- **Prieto-Cubides, Jonathan** (May 2024). *Mechanised proofs in Agda for the manuscript "Investigations into Graph-theoretical Constructions in Homotopy Type Theory"*. DOI: 10.5281/zenodo.11092174.
- – (2022). On Homotopy of Walks and Spherical Maps in Homotopy Type Theory. In: *Proceedings of the 11th ACM SIGPLAN International Conference on Certified Programs and Proofs. CPP 2022*. Philadelphia, PA, USA: Association for Computing Machinery, pp. 338–351. DOI: 10.1145/3497775.3503671.
- **Prieto-Cubides, Jonathan** and Camilo Argoty (2018). Dealing with Missing Data using a Selection Algorithm on Rough Sets. *International Journal of Computational Intelligence Systems* 11.1, p. 1307. DOI: 10.2991/ijcis.11.1.97.
- **Prieto-Cubides, Jonathan** (2017). *Proof-Reconstruction in Type Theory for Propositional Logic*. Master's Thesis. DOI: <http://doi.org/10.5281/zenodo.1127672>.

SELECTED TALKS

- **25th International Conference on Types for Proofs and Programs (TYPES)**
Oslo, Norway, June 11, 2019
Talk Title: "*Planar graphs in univalent mathematics*"
- **ICT PhD Forum, University of Bergen**
Voss, Norway, October 26, 2020
Talk Title: "*Automatic theorem proving, an act of trust*"
- **Topology Seminar, Department of Mathematics, University of Louisiana at Lafayette**
Louisiana, United States, November 2018
Talk Title: "*Pathovers in dependent type theory*"
- **Agda Implementors' Meeting XXV, University of Chalmers**
Gothenburg, Sweden, May 9-15, 2017
Talk Title: "*Proof-reconstruction in Agda*"
- **Logic seminar, Universidad EAFIT**
Medellín, Colombia, 2016-2017
 - "*Model checking with Alloy*"
 - "*Kripke semantics*"
 - "*Simple typed lambda calculus*"

EVENTS

- **Midlands Graduate School (MGS) in Cyberspace**
April 12-16, 2021
- **HoTT Summer School**, Pittsburgh, USA
August 2019
- **TYPES 2019**, Oslo, Norway
June 2019
- **Midlands Graduate School (MGS)**, University of Birmingham, UK
- **EUTypes Summer School**, Ohrid, Macedonia
August 8-12, 2018

MENTIONS & AWARDS

- Research Fellow at the University of Bergen.
- First in Class 2017, Master in Applied Mathematics at Universidad EAFIT.
- Research Fellow in the Master program in Applied Mathematics at Universidad EAFIT.
- Financial Aid during my math studies at Universidad Sergio Arboleda.
- Scholarship to attend Agda Implementors' Meeting XXV at Chalmers University, Gotenburg, Sweden.
- Ranked 9th WTF Team, ACM-ICPC 2013 South America Regional contest.
- Ranked 11th WTF Team in the Colombian National Contest.
- Honor Mention in the Colombian Math Contest 2010, Universidad Antonio Nariño.
- Scholarship to present a poster at the Symposium ANTS X, University of California, San Diego, July 9–13, 2012.
- Ranked **4/1000** in the National Colombian Qualification Exam, ICFES.
- Early Promotion (5-6th and 7-8th grade), High School, Bogotá, Colombia.