

Personal information and contact data

Full name Martín Ignacio Ugarte Caraball
Birth September 13, 1988, Santiago de Chile
Website <https://martinugarte.com>

Positions

Sept. 2023–Today CTO, Fintual
September 2022–September 2023 VP of Technology, Fintual
April 2022–September 2022 Technical Lead, Architecture team, Fintual
2021–2023 Teaching fellow, Pontificia Universidad Católica de Chile. Cryptography and Computational Security
September 2021–April 2022 Technology consultant, Fintual
January 2021–April 2022 Technology consultant, Ministry of Interior, Chile
September 2019–June 2021 Director of Technology, Millennium Institute for Foundational Research on Data (IMFD), Chile
November 2018–August 2019 Researcher and Technology Transfer Engineer, Millennium Institute for Foundational Research on Data (IMFD), Chile
October 2015–October 2018 Postdoctoral Researcher, Department of Computer & Decision Engineering (CoDE), Université Libre de Bruxelles (ULB), Brussels, Belgium
2011–2014 Teaching fellow, Pontificia Universidad Católica de Chile. Formal Logics for Computer Science
2011–2013 Teaching fellow, Pontificia Universidad Católica de Chile. Introduction to Programming

Education

March 2011–September 2015 Ph.D. in Computer Science, Computer Science Department, School of Engineering, Pontificia Universidad Católica de Chile
Winter 2012 Ph.D. Internship, Hasselt University, Flandes, Belgium
Winter 2010 Undergraduate exchange program, University of California, Santa Barbara
March 2007–December 2010 Bachelor in Mathematics, Faculty of Mathematics, Pontificia Universidad Católica de Chile

Languages

Advanced Spanish; English; Python; JavaScript; TypeScript; \LaTeX ; SQL
Intermediate Rust; Java; Ruby; Solidity; C++; C; Bash; Scala; PHP; Golang
(Very) Basic French; Portuguese; Assembly

Personal projects & development

- December 2012–present Resultado Exacto <https://www.resultadoexacto.com>; co-founder and full-stack developer
- March 2012–present Online Turing Machine Simulator <https://www.turingmachinesimulator.com>; author and developer

Practical Skills

- Web development Full-stack developer. Mostly Django, Rails, Vue and React
- Cryptocurrencies Advanced understanding of the Bitcoin protocol and related topics
- GNU/Linux 10+ years of experience with GNU/Linux systems
- Databases Experience with SQL, RDBMS and Data Analytics tools
- Devops CI/CD management and deployment of technological projects, experience with AWS, Docker, Kubernetes, Docker Swarm, GCP
- Infrastructure General experience setting up computer networks and servers
- Cryptography Understanding of modern cryptographic protocols and their practical use cases

Scientific Publications

Journal Papers

- 2021 Alejandro Grez, Cristian Riveros, Martín Ugarte. *A Formal Framework for Complex Event Recognition*. ACM Transactions on Database Systems, Volume 46, Issue 4
- 2020 Fernando Florenzano, Cristian Riveros, Martín Ugarte, Stijn Vansummeren and Domagoj Vrgoc. *Efficient Enumeration Algorithms for Regular Document Spanners*. ACM Transactions on Database Systems, Volume 45, Issue 1
- Muhammad Idris, Wolfgang Lehner, Martín Ugarte, Stijn Vansummeren and Hannes Voigt. *General dynamic Yannakakis: conjunctive queries with theta joins under updates*. The VLDB Journal, Volume 29, Issue 2
- 2018 Fernando Rosas, Pedro A.M. Mediano, Martín Ugarte and Henrik J. Jensen. *An Information-Theoretic Approach to Self-Organisation: Emergence of Complex Interdependencies in Coupled Dynamical Systems*. Entropy, Volume 20, Issue 10
- 2017 Marcelo Arenas and Martín Ugarte. *Designing a Query Language for RDF: Marrying Open and Closed Worlds*. ACM Transactions on Database Systems, Volume 42, Issue 4
- 2014 Martín Ugarte, Marcelo Arenas, Jonny Daenen, Frank Neven, Jan Van Den Bussche, and Stijn Vansummeren. *Discovering XSD Keys from XML Data*. ACM Transactions on Database Systems, Volume 39, Issue 4

Conference Papers

- 2020 Alejandro Grez, Cristian Riveros, Martín Ugarte and Stijn Vansummeren. *On the Expressiveness of Languages for Complex Event Recognition*. In Proceedings of the 18th International Conference on Database Theory, ICDT 2020
- Marcelo Arenas, Juan L. Reutter, Martín Ugarte, Francisco José Vial Prado and Domagoj Vrgoc. *Cryptocurrency Mining Games with Economic Discount and Decreasing Rewards*. 37th International Symposium on Theoretical Aspects of Computer Science, STACS 2020
- 2019 Felipe Bravo-Marquez, Steve Reeves, Martín Ugarte *Proof-of-Learning: A Blockchain Consensus Mechanism Based on Machine Learning Competitions*. IEEE International Conference on Decentralized Applications and Infrastructures, DAPPCON 2019, San Francisco, California

- Alejandro Grez, Andrea Calí, Martín Ugarte *A Simple Data Structure for Optimal Two-Sided 2D Orthogonal Range Queries*. Proceedings of the 13th International Conference on Flexible Query Answering Systems, FQAS 2019, Amantea, Italy
- Alejandro Grez, Cristian Riveros, Martín Ugarte *A formal framework for Complex Event Processing*. Proceedings of the 22nd International Conference on Database Theory, ICDT 2019, Lisbon, Portugal
- 2018 Fernando Florenzano, Cristian Riveros, Martín Ugarte, Stijn Vansummeren and Domagoj Vrgoc. *Constant Delay Algorithms for Regular Document Spanners*. Proceedings of the 37th ACM SIGMOD-SIGACT-SIGAI Symposium on Principles of Database Systems, PODS 2018, Houston, USA, pages 165 - 177
- Muhammad Idris, Martín Ugarte, Hannes Voigt, Stijn Vansummeren and Wolfgang Lehner. *Conjunctive Queries with Inequalities Under Updates*. Proceedings of the 44th Very Large Databases Conference, VLDB 2018, Rio de Janeiro, Brazil. To appear
- 2017 Muhammad Idris, Martín Ugarte, and Stijn Vansummeren. *The Dynamic Yannakakis Algorithm: Compact and Efficient Query Processing Under Updates*. Proceedings of the 2017 International Conference on Management of Data, SIGMOD 2017, Chicago, USA, pages 1259 - 1274
- Alexander Artikis, Alessandro Margara, Martín Ugarte, Stijn Vansummeren and Matthias Weidlich. *Complex Event Recognition Languages: Tutorial*. Proceedings of the 11th ACM International Conference on Distributed and Event-based Systems, DEBS 2017, Barcelona, Spain, pages 7 - 10
- 2016 Marcelo Arenas and Martín Ugarte. *Designing a Query Language for RDF: Marrying Open and Closed Worlds*. Proceedings of the 35th ACM SIGMOD-SIGACT-SIGAI Symposium on Principles of Database Systems, PODS 2016, San Francisco, USA, pages 225–236
- Felipe Pezoa, Juan L. Reutter, Fernando Suarez, Martín Ugarte and Domagoj Vrgoc. *Foundations of JSON Schema*. Proceedings of the 25th International World Wide Web Conference, WWW 2016, Montreal, Canada, pages 263 - 273
- 2015 Egor V. Kostylev, Juan L. Reutter and Martín Ugarte. *CONSTRUCT Queries in SPARQL*. Proceedings of the 18th International Conference on Database Theory, ICDT 2015, Brussels, Belgium, pages 212 - 229
- 2013 Marcelo Arenas, Jonny Daenen, Frank Neven, Martín Ugarte, Jan Van Den Bussche, and Stijn Vansummeren. *Discovering XSD Keys from XML Data*. Proceedings of the 2013 SIGMOD International Conference on Management of Data, SIGMOD 2013, New York, USA, pages 61 - 72

Workshop Papers

- 2018 Andrea Calí and Martín Ugarte. *On the Complexity of Query Answering under Access Limitations: A Computational Formalism*. Proceedings of the 12th Alberto Mendelzon Workshop on Foundations of Data Management, AMW 2018, Cali, Colombia
- Martín Ugarte and Stijn Vansummeren. *On the Difference Between Complex Event Processing and Dynamic Query Evaluation*. Proceedings of the 12th Alberto Mendelzon Workshop on Foundations of Data Management, AMW 2018, Cali, Colombia
- 2017 Andrea Calí, Dadide Martinenghi, Igor Razgon, and Martín Ugarte. *Querying the Deep Web: Back to the Foundations*. Proceedings of the 11th Alberto Mendelzon Workshop on Foundations of Data Management, AMW 2017, Montevideo, Uruguay
- Andrea Calí and Martín Ugarte. *Accessing the Deep Web with Keywords: A Foundational Approach*. Proceedings of the 3rd International KEYSTONE Conference, IKC 2017, Gdańsk, Poland

- 2015 Marcelo Arenas, Carlos Buil-Aranda, Michel Dumontier and Martín Ugarte. *A preliminary investigation into SPARQL query complexity and federation in Bio2RDF*. Presented in the 9th Alberto Mendelzon Workshop on Foundations of Data Management, AMW 2015, Lima, Perú
- Juan L. Reutter, Martín Ugarte and Domagoj Vrgoc. *Satisfiability of JSON Schema and Instance Validation*. Proceedings of the 9th Alberto Mendelzon Workshop on Foundations of Data Management, AMW 2015, Lima, Perú
- 2014 Marcelo Arenas and Martín Ugarte. *Towards a Positive Query Language for RDF*. Proceedings of the 8th Alberto Mendelzon Workshop on Foundations of Data Management, AMW 2014, Cartagena de Indias, Colombia

Invited Talks

- 2019 *Understanding the Bitcoin Protocol, Seriously*. Tutorial. Computer Science Department, Technion, Israel Institute of Technology, Haifa, Israel
- 2018 *Understanding the Bitcoin Protocol, Seriously*. Tutorial. Faculty of Mathematics, Physics & Computer Science, University of Bayreuth, Germany
- Understanding the Bitcoin Protocol*. Tutorial. The 12th Alberto Mendelzon Workshop on Foundations of Data Management, AMW 2018, Cali, Colombia
- Understanding the Bitcoin Protocol*. Invited talk. Faculty of Natural Sciences, Department of Mathematics. London, United Kingdom
- A Technical Perspective on the Bitcoin Protocol and Smart Contracts*. Invited Talk. Big Data Seminars, at Departamento de Ingeniería y Sistemas de Información, Universitat Politècnica de Catalunya, Barcelona, Spain
- Understanding the Bitcoin Protocol*. Invited Talk. Innoviris, the Brussels Institute for Research and Innovation. Brussels, Belgium
- 2017 *Scaling the Bitcoin Protocol via the Lightning Network*. Keynote. Special launch event of Buda.com. Santiago, Chile
- Entendiendo las Criptomonedas*. Invited Talk. Special event by Edho (<http://edho.cl>) and Centro de Conocimiento Tributario (<http://cct.cl>). Santiago, Chile
- The Bitcoin Protocol: A Technical Perspective*. Invited Talk. Department of Computer Science and Information Systems, Birkbeck College, University of London. London, United Kingdom
- Understanding the Bitcoin Protocol, Seriously*. Invited Talk. The 2nd Summer School of the Center for Semantic Web Research. Santiago, Chile

Teaching Experience

- 2021–2023 Teaching fellow, Pontificia Universidad Católica de Chile. Cryptography and Computational Security
- 2019 Instructor, Degree in Big Data and Data Science (Subsecretaría de Desarrollo Social). Professional Education, Engineering School, Pontificia Universidad Católica de Chile
- 2011–2014 Teaching fellow, Pontificia Universidad Católica de Chile. Introduction to Programming (2011 - 2014), Logic for Computer Science (2012 - 2014)
- 2013 Head Coordinator of Introduction to Programming. Department of Computer Science, Engineering School, Pontificia Universidad Católica de Chile
- 2008–2010 Teaching assistant. Faculty of Mathematics, Pontificia Universidad Católica de Chile. Calculus 2 (2008), Real Analysis (2009)
- 2008–2010 Teaching assistant. Department of Computer Science, Engineering School, Pontificia Universidad Católica de Chile. Introduction to Programming (2008 - 2010), Logic for Computer Science (2011), Discrete Mathematics (2011), Computational Complexity (2014)

Academic Activities

- 2021 Tutorials co-chair of the 15th ACM International Conference on Distributed and Event-based Systems, DEBS 2021, Milan, Italy (Online conference)
- 2019 PC Member of the 13th Alberto Mendelzon International Workshop on Foundations of Data Management, AMW 2019, Asunción, Paraguay
- 2018 PC Member of the 12th Alberto Mendelzon International Workshop on Foundations of Data Management, AMW 2018, Cali, Colombia
Proceedings Chair of the 37th ACM SIGMOD-SIGACT-SIGAI Symposium on Principles of Database Systems, PODS 2018, Houston, USA
- 2016 Co-chair of the 2nd International KEYSTONE Conference, IKC 2016, Cluj-Napoca, Romania
- 2015 Proceedings Chair of the 18th International Conference on Extending Database Technology, EDBT 2015, Brussels, Belgium
Proceedings Chair of the 18th International Conference on Database Theory, ICDT 2015, Brussels, Belgium
- 2013–2015 Graduate students representative, Department of Computer Science Committee, Engineering School, Pontificia Universidad Católica de Chile
- 2009–2010 Undergraduate students representative, Faculty of Mathematics Committee, Pontificia Universidad Católica de Chile

Other interests

Football, tennis, padel, golf, motorsports, simracing