

Mario Román

MSc Mathematics and Foundations of Computer Science

Contact

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References

Carmen Constantin
University of Oxford
i.m.carmen@gmail.com

Pedro García-Sánchez
University of Granada
pedro@ugr.es

Francisco Herrera
University of Granada
herrera@decsai.ugr.es

Languages

Spanish (native)
English (C2)
Italian (fluent)

Programming

Experience in **Haskell**, the proof assistants **Agda** and **Coq**, and imperative programming in **C++**.

Software

Technical knowledge of **Gnu/Linux**, **Emacs** and **LaTeX**.

Education

2018-2019 **MSc. Mathematics and Foundations of Computer Science**
University of Oxford

Expected graduation in September 2019.

MSc. Dissertation on Profunctor optics (supervisor: [Jeremy Gibbons](#))

- Categories, Proofs (95/100), Constantin
- Homological Algebra (85/100), Henriques
- Quantum Comp. Sci. (81/100), Coecke
- Category Theory (91/100), Kirwan
- Categorical Quantum (95/100), Vicary
- Distributional Models (90/100), Coecke

2012-2018 **Bachelor degree in Mathematics** *University of Granada*
Emphasis in abstract algebra. Grade Point Average: 9.55/10.

2012-2018 **Bachelor degree in Computer Science** *University of Granada*
Emphasis in computation. Grade Point Average: 9.35/10

Bachelor's thesis. Category theory and lambda calculus.

Award to the best bachelor's thesis in Mathematics-related areas of the University of Granada (2017-18).

Advisors: [Pedro A. García-Sánchez](#).

2012-2018 **High School** *IES Soto de Rojas*
Emphasis on Science. Grade Point Average: 10/10

2015-2018 **Courses and conferences**

Attended:

- [SYCO 2 \(Strathclyde\)](#) and [SYCO 3 \(Oxford\)](#), on applied category theory.
- [CAP Days - Siegen](#), on computable homological algebra and categories.
- [School on Univalent Mathematics 2017](#) and [2019](#) - Univ. Birmingham.
- [EUTypes Summer School](#), on Homotopy type theory, Agda and Coq.
- [Seminar on Affine group schemes](#), Hopf algebras and algebroids.
- [ESSLLI-Barcelona](#), on Logic, Languages and Computation.
- [Lambda World](#), on functional programming.
- [LaTeX course - OrientaMat](#), volunteering as *teaching assistant*.

2008-2012 **Estalmat** *University of Granada, Spain*
A project to detect and stimulate the precocious mathematical talent.

Publications

2018 **Mikrokosmos: an educational lambda calculus interpreter (pdf)**
Mario Román

DOI: [10.21105/jose.00029](https://doi.org/10.21105/jose.00029)

The Journal of Open Source Education.

2016 **A comparison of implementations of basic evolutionary algorithm operations in different languages**

J.J. Merelo-Guervós, I. Blancas, P. Castillo, G. Romero, V. Rivas, M. García-Valdez, A. Hernández-Aguila, M. Román.

DOI: [10.1109/CEC.2016.7743980](https://doi.org/10.1109/CEC.2016.7743980)

Conference: [IEEE Congress on Evolutionary Computation \(CEC\)](#)

2019 **Discokitty, an implementation of the DisCoCat framework**

Mario Román.

In progress. To be submitted to [SemSpace2019](#).

Research experience

- 2019-ongoing **Applied Category Theory School 2019** ACT 2019
Accepted into the project on *Traversal optics and profunctors*, directed by [Bartosz Milewski](#).
- 2017-2018 **Collaboration and research Fellowship, department of Algebra**
Advisor: [Prof. Pedro A. García-Sánchez](#).
During my Bachelor's thesis. On the categorical semantics of lambda calculus. Studying Martin-Löf type theory as the internal language of locally closed cartesian categories. Agda is used to provide examples of formalized univalent mathematics.

Computer science projects

- 2016-2018 **Mikrokosmos** github.com/mroman42/mikrokosmos
Hackage: hackage.haskell.org/package/mikrokosmos
An didactic free software λ -calculus interpreter written in Haskell supporting multiple evaluation strategies and exemplifying the Curry-Howard isomorphism.
- 2014-2015 **GranaSAT Client** github.com/mroman42/granasatClient
Git repository: github.com/mroman42/granasatClient
Software for a satellite student experiment for the European Space Agency BEXUS campaign.

A complete portfolio can be found on [GitHub](#). I have made contributions to

- The **UniMath Coq library**, by Voevodsky, Greyson, Ahrens et al.
- **Categories, Algebra and Programming GAP package**, by Gutsche, Posur et al.

Awards and Grants

- 2017-2018 **Collaboration Grant (2000€)** Algebra department, University of Granada
By virtue of which I could develop my bachelor's thesis. I administered the department servers, developed *didactic material* and the [Mikrokosmos](#) interpreter, and assisted in the teaching of the course "**Logic and Programming**" (*Lógica y programación*).
- 2015-2016 **Erasmus+ Grant (5442€)** University of Milan
Exchange student at the [University of Milan](#) for a year. Studying at the [department of computer science](#).
- 2012–2013 **International Mathematical Olympiad, IMO (~ 1100€)** Argentina
National Gold (2012) & Silver (2011) Medals and an [International Honourable mention](#) (2012).

Interests

I am passionate about **category theory** and **functional programming** but also about type theory and the applications of category theory. I also am actively involved in the **divulgateion of mathematics** and computer science at a university level.

- 2014–2018 **LibreIM** libreim.github.io/
Founder and coordinator of a [community](#) of Math&CS students. I am the main contributor to our [blog](#) and the organizer of weekly [seminars](#) where I have organized seminars about [Haskell](#), [Category theory](#) and [Constructive mathematics](#), among other topics.