

Mario Román

Mathematics and Computer Science student

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, English, Italian

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 Founds. of Computer Science [University of Oxford](#)
Candidate. Expected graduation in September 2019. MSc. Dissertation on Profunctor optics (ongoing, supervisor: [Jeremy Gibbons](#))

- Categories, Proofs (95/100)
- Homological Algebra (85/100)
- Quantum Comp.Sci. (81/100)
- Category Theory (91/100)

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

- Calculus
- Geometry, linear algebra
- Numerical methods
- Probability
- Algebra
- Analysis and measure theory
- Topology
- Non-euclidean geometry
- Algebraic topology
- Galois theory
- Mathematical modelling
- Statistical inference
- Curves and surfaces
- Differential equations
- Number theory, cryptography
- Computational algebra
- Modern algebra
- Logic, discrete mathematics

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

- C++ Programming
- System administration
- Computer architecture
- Operative systems
- Algorithms
- Data structures
- Object-oriented programming
- Computability theory
- Automata and languages
- Software engineering
- Information theory
- Functional programming
- Databases
- Computer graphics
- Artificial intelligence
- Metaheuristics

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.

Mathematics

2019-ongoing **Applied Category Theory School 2019** [ACT 2019](#)
Accepted into the project on *Traversal optics and profunctors*, directed by [Bartosz Milewski](#).

2017-2018 **Category theory and λ -calculus (pdf)** [Bachelor's thesis](#)
Advisor: [Prof. Pedro A. García-Sánchez](#).
Prize to the best bachelor's thesis in Mathematics of the University of Granada (2017-18). On categorical semantics of lambda calculus. Studies 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 at [GitHub](#). In particular, I am a contributor to

- Voevodsky-Greyson-Ahrens's **UniMath** [Coq library](#).
- Gutsche-Posur's **Categories, Algebra and Programming** [GAP package](#).

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 \(CEC\)](#)

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)** [Argentina](#)
National *Gold* (2012) & *Silver* (2011) *Medals* and an [International Honourable mention](#) (2012).

Interests

I am passionate about **category theory**, **type theory**, **logic** and their applications to functional programming and proof assistants. I also am actively involved in the **divulagation 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.