

# Mario Román

MSc Mathematics and Foundations of Computer Science

## Contact

Mario Román García  
+34 693 833838  
mromang08@gmail.com  
mroman42.github.io  
linkedin:mario-roman

## 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

Links to projects

- Haskell
- C
- C++
- Emacs Lisp
- Agda
- Coq
- GAP
- F
- Java
- Scala
- Ruby

## Software

- Gnu/Linux
- Emacs
- LaTeX
- Git/GitHub/GitLab
- MySQL

## Education

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

*Expected graduation in September 2019 (Grade average: 91.4).*

*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](#).*

2006-2012 **High School**

IES Soto de Rojas

*Emphasis on Science. Grade Point Average: 10/10*

*Music School, specialty on Violin, 2002-12.*

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](https://github.com/mroman42/mikrokosmos)  
*Hackage: [hackage.haskell.org/package/mikrokosmos](https://hackage.haskell.org/package/mikrokosmos)*  
An didactic free software  $\lambda$ -calculus interpreter written in Haskell supporting multiple evaluation strategies and exemplifying the Curry-Howard isomorphism.
- 2014-2015 **GranaSAT Client** [github.com/mroman42/granasatClient](https://github.com/mroman42/granasatClient)  
*Git repository: [github.com/mroman42/granasatClient](https://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 also actively involved in the **divulgation of mathematics** and computer science at a university level.

- 2014–2018 **LibreIM** [libreim.github.io/](https://libreim.github.io/)
- Founded a local [community](#) of Math&CS students.
  - Organized seminars, gathering interested students and speakers.
  - Main contributor to our [blog](#).
  - Prepared seminars on [Haskell](#), [Category theory](#) and [constructive mathematics](#), among others.
  - Worked with a group of students to keep the LibreIM organization working without me after leaving Granada.