

Jordi Roca Lacostena

Curriculum Vitae

Personal Information

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Education

2017 - 2021 **Ph. D. in Applied Mathematics.**
Universitat Politècnica de Catalunya.
Thesis title: *The embedding problem for Markov matrices.*
Advisors: Dr. Marta Casanellas and Dr. Jesús Fernández-Sánchez.
Excellent Cum Laude.

2013 - 2015 **Master in Advanced Mathematics and Mathematical Engineering.**
Universitat Politècnica de Catalunya.
Advisors: Dr. Jesús Cerquides and Dr. Jesús Fernández-Sánchez.
Master's thesis: *Looking for Transcription Factor Binding Sites.*

2008 - 2013 **Bachelor's degree in Mathematics.**
Specialisation in fundamental mathematics.
Universitat Autònoma de Barcelona.
Bachelor's thesis: *Generalizing Semiring induced Valuation Algebras.*
Advisor: Dr. Jesús Cerquides.

2008 - 2011 **Informatics engineering.**
Unfinished studies (First cycle of the studies completed).
Universitat Autònoma de Barcelona

Language Skills

Catalan Native.
Spanish Bilingual.
English C1 (Advanced).

Grants

2018 - 2021 **AGAUR 2018FI B 00947.**
Ph. D. Grant conceded by Generalitat de Catalunya.

Professional Experience

- 2021 - present **Data scientist.**
Amalfi analytics.
- 2016 - 2021 **Academic and research staff.**
Department of Mathematics.
Universitat Politècnica de Catalunya.
- 2017 - 2018 **Research assistant.**
Barcelona School of Industrial Engineering.
Universitat Politècnica de Catalunya.
- 2014 - 2016 **Mathematical analyst.**
Artificial Intelligence Research Institute.
Spanish Council for Scientific Research.
- 2014 **Artificial Intelligence analyst.**
Technology Development Unit in Artificial Intelligence.
Spanish Council for Scientific Research.
- 2013 - 2014 **Artificial Intelligence analyst**
IplusD Inova.

Publications and Preprints

- 2021 Marta Casanellas, Jesús Fernández-Sanchez, Jordi Roca-Lacostena.
The embedding problem for Markov matrices.
Publicacions Matemàtiques (accepted for publication).
- 2021 Jordi Roca-Lacostena.
Generating embeddable matrices whose principal logarithm is not a Markov generator.
Chapter in Research Perspectives CRM Barcelona - Extended Abstracts GEOMVAP 2019. Birkhäuser Basel.
DOI: 10.1007/978-3-030-84800-2.
- 2020 Marta Casanellas, Jesús Fernández-Sanchez, Jordi Roca-Lacostena.
An open set of 4×4 embeddable matrices whose principal logarithm is not a Markov generator.
Linear and Multilinear Algebra, 0(0), pp. 1-12.
DOI: 10.1080/03081087.2020.1854165.
- 2020 Marta Casanellas, Jesús Fernández-Sanchez, Jordi Roca-Lacostena.
Embeddability and rate identifiability of Kimura 2-parameter matrices.
Journal of Mathematical Biology, 80(4), pp. 995-1019.
DOI: 10.1007/s00285-019-01446-0
- 2019 Jordi Roca-Lacostena, Jesús Cerquides, Marc Pouly.
Sufficient and necessary conditions for Dynamic Programming in Valuation-Based Systems.
International Journal of Approximate Reasoning, 114, pp. 51-83.
DOI: 10.1016/j.ijar.2019.08.006
- 2018 Jordi Roca-Lacostena, Jesús Fernández-Sanchez.
Embeddability of Kimura 3ST Markov matrices.
Journal of Theoretical Biology, 445, pp. 128-135.
DOI: 10.1016/j.jtbi.2018.02.005

Courses, Seminars and Conferences

- 2021 **Seminari de geometria algebraica.**
Universitat de Barcelona.
Invited speaker.
- 2020 **Spanish Mathematical Royal Society - Young researchers meeting.**
Universitat Jaume I.
Invited speaker.
- 2019 **SIAM conference on Applied Algebraic Geometry.**
Universität Bern.
Presentation of a poster.
- 2019 **GEOMVAP meeting.**
Universitat Politècnica de Catalunya.
Contributed talk.
- 2018 **Summer School in Algebraic Statistics.**
University of Tromsø (Norway)
Contributed talk.
- 2018 **CIMPA Research School - Latinamerica: Commutative Algebra with Applications to Statistics and Coding Theory**
Universidad Autónoma de Zacatecas (Mexico).
Contributed talk.
- 2018 **Fourth EACA International School on Computer Algebra and its Applications.**
Universidad de Santiago de Compostela.
Contributed talk.
- 2017 **Foundations of Computational Mathematics 2017.**
Universitat de Barcelona.
Presentation of a poster.
- 2017 **Bioinformatics Research Group in Epidemiology Seminar. PRBB -**
Barcelona Biomedical Research Park.
Invited speaker.
- 2017 **Algebraic and combinatorial phylogenetics monthly program.**
FME-UPC and PRBB.
Contributed talk.
- 2017 **Workshop on Algebraic and combinatorial phylogenetics.**
FME-UPC and PRBB.
Organizer.
- 2017 **Barcelona Mathematical days 2017.**
Institut d'Estudis Catalans.
Presentation of a poster.
- 2016 **Summer School on Algebra, Statistics and Combinatorics.**
Aalto University (Finland).
- 2013 **SeisMath Intensive Program: Mathematical models in Seismology.**
Università degli Studi dell'Aquila (Italy).

Teaching Experience

- 2020-2021 **Algebra.**
Bioinformatics degree.
Seminar and Theory lectures - 60 hours.
Coordinator.
School of International Studies (ESCI- UPF).
- 2019-2020 **Algebra.**
Bioinformatics degree.
Seminar and Theory lectures - 30 hours.
School of International Studies (ESCI- UPF).
- 2017-2018 **Mathematical Fundamentals.**
Bachelor's degree in Architectural Technology and Building Construction.
Seminar and Theory lectures - 120 hours.
Barcelona School of Building Construction (EPSEB-UPC).
- 2017-2018 **Linear Algebra.**
Bachelor's degree in Industrial Technology Engineering.
Seminar and Theory lectures - 60 hours.
Barcelona School of Industrial Engineering (ETSEIB-UPC).
- 2016-2017 **Calculus.**
Biomedical, Materials, Mechanical and Chemical Engineering degrees.
Seminar lectures - 15 hours.
Barcelona East School of Engineering (EEBE-UPC).
- 2016-2017 **Numerical Calculus and Differential Equations.**
Biomedical, Materials, Mechanical and Chemical Engineering degrees.
Seminar and Theory lectures - 60 hours.
Barcelona East School of Engineering (EEBE-UPC).

Directed thesis

- 2018 **Clea Parcerisas Serrahima** - Master's degree in Industrial Engineering.
Universitat Politècnica de Catalunya.
An ocean sound map along the track of a journey around the globe - Underwater soundscapes of the Great Coral Reef.