Catalina Vich Llompart

Curriculum Vitae

Personal Details

Job Position	Assistant Lecturer with a PhD
Affiliation	Universitat de les Illes Balears Departament de Ciències Matemàtiques i Informàtica Matemàtica Aplicada
Address	Cra. Valldemossa, Km 7.5 07122 Palma, Mallorca (Spain)
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Résumé

In 2010 I obtained the Bachelor's degree in Mathematics by the Universitat de les Illes Balears (UIB) receiving the special award for the best qualifying record of his promotion. In 2011 I attended the official Master Master in Advanced Mathematics and Mathematical Engineering at the Universitat Politècnica de Catalunya (UPC), a master training that ensures a greater formation in dynamic systems and neuroscience. In 2012, I also attended a master in teacher training Màster Universitari de Formació del Professorat which has provided a didactic knowledge about teaching mathematics. Since September 2012, I am employed at UIB, both in teaching and research tasks.

In 2016, I finished the PhD in Mathematics at the Universitat de les Illes Balears under the supervision of Dr. Antoni Guillamon Grabolosa (UPC) and Dr. Rafel Prohens Sastre (UIB). My main research focuses on Computational Neuroscience and Dynamic Systems. I study the problem of estimation of the synaptic conductance (estimate what is the synaptic current that a single neuron is receiving), the plasticity in neural network, and the reconstruction of piecewise linear models that reproduce different neural behaviors. She is currently principal investigator of an international CRCNS project for the study of neural circuit-level mechanisms of adaptive decision-making.

Education

2013–2016 **PhD in applied mathematics (dynamical systems) and computational neuroscience**, *Universitat de les Illes Balears (UIB)*, thesis title: Inverse Methods to estimate synaptic conductances with emphasis on non-smooth dynamical systems, advisors: Antoni Guillamon and Rafel Prohens.
Grade: Excellent Cum Laude

2011–2012 **Master's Degree in Teacher Training**, *Universitat de Illes Balears (UIB)*, master thesis title: Tècnica del Jigsaw en l'Educació Secundària, advisor: Francesc Artigues Estarellas.
Grade: 8.99/10

2010–2011 **Master in Advanced Mathematics and Mathematical Engineering**, *Universitat Politècnica de Catalunya (UPC)*, master thesis title: Analytical and Numerical methods for estimating conductances in neurons, advisor: Antoni Guillamon, An interuniversitary master between the Universitat Politècnica de Catalunya (UPC) and the Universitat de Barcelona (UB) to obtain an specific formation in dynamical systems and neurosciences..
Grade: 9.07/10

2005–2010 **Degree in Mathematics**, *Universitat de Illes Balears (UIB)*, This certificate was obtained with the National Award for Excellence in Academic Performance (Award to obtain the best expedient grade of the promotion).
Grade: 7.61/10

2005 **General Certificate of Education (GCE), modality of Natural Science – Human Biology**, *IES Llucmajor*, Mallorca.
Grade: 8.6/10

Current Research

Perturbation theory — Existence of Canard orbits in slow-fast piecewise linear systems and use these kind of systems to model different neuronal behaviours.

Neuroscience — Modelling and simulation of the behaviour of a neuron through ordinary differential equations and stochastic differential equations. More specific, I am working in the problem of Conductance's estimation. I am trying to estimate the conductances (which are coming from excitatory and inhibitory neurons) that a single neuron is receiving.
Study of the conductances of neural networks combining periods of high activity and periods of silence. Effects caused from the synaptic plasticity.
Developing a general learning rule to simulate the performance in a two-alternative forced choice task, driven by changes in dopamine signalling induced by outcomes of actions, that varies over the course of simulations.

Publications

2020 Effects of the short term plasticity in UP-DOWN cortical dynamics. C. Vich, P. Massobrio, A. Guillamon. BioRxiv (submitted manuscript)

2020 Estimation of Synaptic Activity during Neuronal Oscillations. C. Vich, R. Prohens, A.E. Teruel, A. Guillamon. Mathematics (accepted, 2020)

2020 Corticostriatal synaptic weight evolution in a two-alternative forced choice task: a computational study. C. Vich, K. Dunovan, T. Verstynen, J. Rubin. Communications in Nonlinear Science and Numerical Simulation, 82 (2020)

2020 The credit assignment problem in cortico-basal ganglia-thalamic networks: a review, a problem, and a possible solution. J. E. Rubin, C. Vich , M. Clapp, K. Noneman, T. Verstynen. European Journal of Neuroscience, (2020).

2019 Reward-driven changes in striatal pathway competition shape evidence evaluation in decision-making. K. Dunovan, C. Vich, M.Clapp, T. Verstynen, J. Rubin. PLOS Computational Biology, 15(5) (2019).

2017 Estimation of synaptic conductances in the spiking regime for the McKean neuron model. A. Guillamon, R. Prohens, A. E. Teruel, C. Vich. SIAM Journal on Applied Dynamical Systems, 16(3) (2017), pp 1397-1424

2017 Estimation of synaptic conductances in presence of nonlinear effects caused by subthreshold ionic currents. C.Vich, R.W. Berg, A. Guillamon, S. Ditlevsen. Frontiers in Computational Neuroscience, 11, (2017), ISSN: 1662-5188

2016 Slow-fast n-dimensional piecewise linear differential systems. R. Prohens, A. E. Teruel, C. Vich. Journal of Differential Equations. 260 (2) (2016), pp. 1865–1892, ISSN: 0022-0396

2015 Dissecting estimation of conductances in subthreshold regimes. C.Vich and A. Guillamon. Journal of Computational Neuroscience. 39(3) (2015), pp. 271–287, ISSN: 0929-5313

Conference papers and published abstracts

2018 Dopaminergic changes in striatal pathway competition modify specific cognitive decision parameters. K. Dunovan, C.Vich, M. Clapp, J. Rubin, T. Verstynen. Conference paper in 2018 Conference on Cognitive Computational Neuroscience, January 2018. DOI: 10.32470/CCN.2018.1034-0

2017 A non-linear stochastic strategy to estimate synaptic conductances under the presence of subthreshold ionic currents. C.Vich, R.W. Berg, A. Guillamon, S. Ditlevsen. BMC Neuroscience, 18(1) (2017), pp. 44

2016 Nonlinear estimation of synaptic conductances via piecewise linear systems. A. Guillamon, R. Prohens, A.E. Teruel, C. Vich. Research Perspectives CRM Barcelona (Trends in Mathematics , Birkhäuser). ISSN: 2297-0215

2015 Analytical strategies for the nonlinear estimation of conductance's. A. Guillamon, R. Prohens, A.E. Teruel, C. Vich. BMC Neuroscience, 16(1) (2015), pp. 251

2014 Dissecting estimation of conductances in subthreshold regimes. C. Vich, A. Guillamon. BMC Neuroscience, 15(1) (2014), pp. 151

2014 Effects of short-term synaptic plasticity mechanisms on the dynamics of the network conductances. C. Vich, P. Massobrio, A. Guillamon. BMC Neuroscience, 15(1) (2014), pp. 150

Other publications

2011 Analytical and Numerical Methods for Estimating Conductances in Neuron. Master dissertation. Universitat Politècnica de Catalunya (UPC), Juny 2011. Abstract published in Societat Catalana de Matemàtiques, ISSN: 1696-8247 pp. 85

2010 Estudi sobre el pont de Wien no lineal. Revista Enginy@eps núm. 2 any 2010 ISSIN: 1889-4771

Funded Projects

2021–2024 Member of the research project MCYT/FEDER number PID2020-118726GB-I00. Principal Investigator: Prof. Rafel J. Prohens (UIB), José Luis Bravo Trinidad (UEx).

2020–2023 Principal Investigator of the research project PCI 2020 (international program: CRCNS) with reference number PCI2020-112026.

2018–2019 Member of the educational innovation project Curs Zero on-line de Matemàtiques i Física. Principal Investigator: Joan Carles Pons Mayol (UIB).

2018–2021 Member of the research project MCYT/FEDER number MTM2017-83568-P. Principal Investigator: Prof. Rafel J. Prohens (UIB).

2016–2018 Member of the research project MCYT/FEDER number MTM2015-71509-C2-2-R. Principal Investigator: Prof. Antoni Guillamon i Grabolosa (UPC).

2015–2018 Member of the research project MCYT/FEDER number MTM2014-54275. Principal Investigator: Prof. Rafel J. Prohens (UIB).

2013–2014 Member of the educational innovation project Versió prototip d'un Curs Zero Virtual de Matemàtiques. Principal Investigator: Dr. Francesc A. Rosselló Llompart (UIB).

2012–2015 Member of the research project MCYT/FEDER number MTM2011-22751. Principal Investigator: Prof. Rafel J. Prohens (UIB).

Internships

Long stay

2017–2018 **Research state with Jonathan Rubin**, *Department of Mathematics and Centre for the Neural Basis of Cognition, University of Pittsburgh (Pennsylvania)*, Topic: Develop a spike timing-dependent plasticity rule to model the effects of Phasic dopamine plasticity in the basal ganglia.
Post-Doctoral stay, from 28-07-2017 to 29-01-2018

2015–2016 **Research state with Susanne Ditlevsen**, *Research Group Statistics and Probability Theory, Department of Mathematical Science, University of Copenhagen (Denmark)*, Topic: Estimation of conductances using non-deterministic models.
Doctoral stay, from 22-09-2015 to 27-01-2016

2008–2009 **Exchange Student**, *University of Texas at Austin (Texas)*.
Undergrad, from August 2008 to January 2009

Short stay

2018 **Research state with Jonathan Rubin**, *Department of Mathematics and Centre for the Neural Basis of Cognition, University of Pittsburgh (Pennsylvania)*, Topic: Advance on developing a spike timing-dependent plasticity rule to model the effects of Phasic dopamine plasticity in the basal ganglia.
Post-Doctoral stay, from 22-10-2018 to 01-11-2018

2016 **Research state with Susanne Ditlevsen**, *Research Group Statistics and Probability Theory, Department of Mathematical Science, University of Copenhagen (Denmark)*, Topic: A strategy for non-linear estimation of synaptic conductance.
Doctoral stay, from 17-04-2016 to 22-04-2016

2014 **Research state with Dr. Paolo Massobrio** , *NBT, DIBRIS, University of Genova (Italy)*, Topic: Effects of the synaptic conductances in the presence of short-term plasticity mechanisms.
Doctoral stay, from 10-02-2014 to 14-02-2014

Conference Contributions and Seminars

2021 **Ddays (2021)**. C.Vich *Blanco o negro? Cómo elegimos*. Lleida (Spain) on 09-09-2021.

2021 **International Conference on Mathematical NeuroScience (ICMNS2021)**. C.Vich *Mapping neural activity and behavioral data* Online from 28-06-2021 to 01-07-2021.

2020 **II Jornadas científicas sobre sistemas dinámicos y sus aplicaciones**. C. Vich *Nerual networks: a work on plasticity*. Mallorca (Spain) on 23-07-2020.

2018 **7th Iberian Mathematical Meeting (7IMM)**. A. Guillamon, R. Prohens, A.E. Teruel, C. Vich *Estimating the synaptic conductance in the oscillatory regime*. Évora (Portugal) on 13-10-2018.

2018 **International workshop on neurodynamics (NDy'18)**. C. Vich, K. Dunovan, M. Clapp, J. Rubin, T. Verstynen *Phasic dopamine influences on a two-alternative forced choice task*. Castro Urdiales (Spain) on 28-09-2018.

2018 **Jornades científiques sobre l'estudi qualitatiu de sistemes dinàmics i les seves aplicacions 2018**. A. Guillamon, C. Vich *Mathematical strategies to estimate synaptic conductances*. Mallorca (Spain) on 21-09-2018.

2018 **Analysis and Modeling of Complex Oscillatory Systems (AMCOS)**. C. Vich, K. Dunovan, M. Clapp, J. Rubin, T. Verstynen *Phasic dopamine influences on action value estimation*. Barcelona (Spain) on 21-03-2018.

2018 **Computational and Systems Neuroscience (Cosyne) 2018**. K. Dunovan, C. Vich, M. Clapp, J. Rubin, T. Verstynen *Dopaminergic changes in striatal pathway competition modify specific decision parameters*. Denver (Colorado) on 01-03-2018.

2017 **Seminar at University of Pittsburgh, Department of Mathematical**. C. Vich. *Two strategies to estimate synaptic conductances under nonlinear effects*. Pittsburgh (Pennsylvania) on 10-11-2017.

2017 **26th Annual Computational Neuroscience Meeting (CNS 2017)**. C.Vich, R.W. Berg, T. Guillamon, S. Ditlevsen. *A non-linear stochastic strategy to estimate synaptic conductances under the presence of subthreshold ionic currents*. Antwerp (Belgium) from 16-07-2017 to 19-07-2017. Poster Presentation.

2017 **CEDYA + CMA 2017. XXV Congreso de ecuaciones diferenciales y aplicaciones / XV Congreso de matemática aplicada**. R. Prohens, A.E. Teruel, C. Vich. *Dynamics given in slow-fast n-dimensional piecewise linear differential systems far from the folded manifold*. Cartagena (Murcia) from 26-06-2017 to 30-06-2017. Oral communication.

2017 **Barcelona Computational, Cognitive and systems Neuroscience (BARCCSYN) 2017**. C. Vich, P. Massobrio, A. Guillamon. *Effects of short-term synaptic plasticity on the dynamics of a conductance-based neuronal network model*. Barcelona (Catalunya) from 15-06-2017 to 16-06-2017. Poster Presentation.

2017 **Third International Conference on Mathematical NeuroScience (ICMNS)** A. Guillamon,R. Prohens, A.E. Teruel, C. Vich. *A first approach to estimate synaptic conductances in the spiking regime* Boulder (Colorado) from 30-05-2017 to 02-06-2017. Oral communication.

2017 **Workshop on "Brain Dynamics and Statistics: Simulation versus Data"**. C. Vich. *Different strategies to estimate synaptic conductances*. Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Alberta (Canada) from 26-02-2017 to 03-03-2017. Poster Presentation.

2016 **Ddays (2016)**. C. Vich. *Invers methods to estimate synaptic conductances with emphasis on non-smooth dynamical systems*. Salou (Catalunya) from 09-11-2016 to 11-11-2016. Oral communication.

2016 **10th European Conference on Mathematical and Theoretical Biology and SMB Meeting (ECMTB2016)**. C. Vich. *Analytical strategies for the nonlinear estimation of conductances*. Nottingham (United Kingdom) from 11-07-2016 to 15-07-2016. Oral communication and Chair of the *Neuroscience 1 – Networks* session.

2016 **1st Workshop on Dynamical Systems in the Real Life**. C. Vich. *Inverse methods to estimate synaptic conductances with emphasis on non-smooth dynamical systems*. Castelló (Spain) from 07-07-2016 to 08-07-2016. Oral communication.

2016 **Second International Conference on Mathematical NeuroScience (ICMNS)**. C. Vich, R. Berg, A. Guillamon, S. Ditlevsen. *A strategy for non-linear estimation of synaptic conductances*. Antibes - Juan Les Pins (France) from 30-05-2016 to 1-06-2016. Oral communication.

2016 **Retreat at Kolle-Kolle by Københavns Universitet**. C. Vich, R. Berg, S. Ditlevsen, A. Guillamon, R. Prohens, A.E. Teruel, *Nonlinear strategies to estimate synaptic conductances*. Copenhagen (Denmark) on 20-04-2016. Invited talk.

2016 **Open problemes in nonsmooth dynamics**. A. Guillamon, R. Prohens, A.E. Teruel, C. Vich. *Estimation of synaptic conductances in McKean neuron model*. Bellaterra (Catalunya) from 01-02-2016 to 05-02-2016. Oral communication.

2016 **Seminar at University of Copenhagen, Department of Mathematical Sciences**. C. Vich. *A strategy for non-linear estimation of synaptic conductances*. Copenhagen (Denmark) on 25-01-2016.

2015 **24th Annual Computational Neuroscience Meeting (CNS 2015)**. A. Guillamon, R. Prohens, A.E. Teruel, C. Vich. *Estimation of synaptic conductances: analytic strategies for subthreshold oscillations and for the McKean neuron model* Prague (Czech Republic) from 18-07-2015 to 23-07-2015. Poster presentation.

2015 **Barcelona Computational, Cognitive and systems Neuroscience (BARCCSYN) 2015**. T. Guillamon, R. Prohens, A.E. Teruel, C. Vich. *Analytical strategies for the nonlinear estimation of conductances*. Bellaterra (Catalunya) from 18-06-2015 to 19-06-2015. Poster presentation.

2014 **Ddays (2014)**. Badajoz (Spain) from 12-11-2014 to 14-11-2014. Local committee member.

2014 **23th Annual Computational Neuroscience Meeting (CNS 2014)**. C. Vich, A. Guillamon, P. Massobrio. *Effects of short-term synaptic plasticity mechanisms on the dynamics of the network conductances*. Quebec City (Canada) from 26-07-2014 to 31-07-2014. Poster presentation.

2014 **23th Annual Computational Neuroscience Meeting (CNS 2014)**. C. Vich, A. Guillamon. *Dissecting estimation of conductances in subthreshold regimes*. Quebec City (Canada) from 26-07-2014 to 31-07-2014. Poster presentation.

2014 **International Workshop on Neurodynamics (Ndy14)**. C. Vich, A. Guillamon. *Difficulties, challenges and solutions in the estimation of synaptic conductances*. Castro Urdiales (Spain) from 14-07-2014 to 17-07-2014. Oral communication.

2014 **10th AIMS Conference on Dynamical systems, Differential Equations and Applications**. R. Prohens, A.E. Teruel, C. Vich. *Slow-fast n-dimensional piecewise linear differential systems*. Madrid (Spain) from 07-07-2014 to 11-07-2014. Oral communication.

2014 **Barcelona Computational and Systems Neuroscience (BARCSYN) 2014**. C. Vich, A. Guillamon. *Data treatment in estimating synaptic conductances: wrong procedures and new proposals*. Barcelona (Catalunya) from 16-06-2014 to 17-06-2014. Oral communication.

2013 **Barcelona Computational and Systems Neuroscience (BARCSYN) 2013**. C. Vich, A. Guillamon. *Dissecting estimation of conductances in subthreshold regimes*. Barcelona (Catalunya) from 13-06-2013 to 14-06-2013. Poster presentation.

2011 **CEDYA + CMA 2011. XXII Congreso de ecuaciones diferenciales y aplicaciones / XII Congreso de matemática aplicada**. Mallorca (Spain) from 05-09-2011 to 09-09-2011. Collaboration at the scientific meeting.

Professional Experience

2017–present **Assistant Lecturer with a PhD**. Universitat de les Illes Balears (UIB). Research at the Dynamical Systems Group and teaching in the Faculty of Education, Higher Polytechnic School and in the Master's Degree in Advanced Physics and Applied Mathematics.

2012–2017 **Assistant Lecturer**. Universitat de les Illes Balears (UIB). Research at the Dynamical Systems Group and teaching in the Faculty of Education.

2011 **Personal teacher**. Academy School *Iniciatives Educatives de Balears, S.L.* Son Ferriol (Mallorca, Spain). Personal teacher of mathematics to High School Students.

Courses Taught

2018–present **Mathematics for Engineering**. First year of Degree in Automation and Industrial Electronic Engineering, Higher Polytechnic School (total of 105h).

2018–present **Ordinary Differential Equations**. Third year of Degree in Mathematics, Higher Polytechnic School (total of 30h).

2018–present **Mathematics EPS and FC - online course**. Preparation course for the science and engineering degrees (total of 20h).

2017–present **Numerical Methods I**. Second year of Degree in Mathematics, Higher Polytechnic School (total of 90h).

2017–present **Mathematical Models in Neuroscience**. Master's Degree in Advanced Physics and Applied Mathematics (total of 18h).

2017–2018 **Mathematics in Primary Education**. First year of Degree in Primary Education, Faculty of Education (total of 140h).

2016–present **ESTALMAT project**. Different lessons about Cryptography for math talented students of 14 and 15 years old (total of 15h).

2016–2017 **Mathematics Teaching I**. Second year of Degree in Primary Education, Faculty of Education (total of 60h).

2015–2016 **Mathematics in Primary Education**. First year of Degree in Primary Education, Faculty of Education (total of 55h).

2013–2017 **Mathematics EPS and FC**. Preparation course for the science and engineering degrees (total of 89h).

2012–2015 **Mathematics Teaching I**. Second year of Degree in Primary Education, Faculty of Education (total of 187h).

Courses Attended

Specialization courses for research

2015 **Summer school on foundations and advances in stochastic filtering (FASF 2015)**. Centre Tecnològic de Telecomunicacions de Catalunya (CTTC). Castelldefels (Catalunya) from 03-05-2015 to 06-05-2015.

2014 **Dynamical modelling methods for systems biology**. Icahn School of medicine at Mount Sinai in Coursera. 6 weeks.

2013 **Advanced Course in Computational Neuroscience (ACCN)**. Instytut Matematyczny, Bedlewo (Poland) from 28-07-2013 to 24-08-2013.

2013 **Synapses, Neurons and Brains**. Hebrew University of Jerusalem in Coursera. 8 weeks.

2013 **7.00X: Introduction to biology – the secret of life**. MITx Massachusetts institute of Technology in EDX / MITx. 12 weeks.

Attendance to scientific meetings

2021 **Virtual Dopamine Conference (VIDA)**. Online from 22-06-2021 to 24-06-2021.

2018 **Conference: New Trend in Mathematical Biology**. Barcelona (Spain) from 04-06-2018 to 08-06-2018.

2017 **Recent Trends in Nonlinear Sciences 2017 (RTNS 2017).** Vigo (Spain) from 23-01-2017 to 26-01-2017.

2016 **Barcelona Computational, Cognitive and Systems Neuroscience (BARCCSYN)**. Barcelona (Catalunya) from 16-06-2016 to 17-06-2016

2013 **Computational Neurosciences (CNS 2013), Tutorial + Main meeting**. Paris (France) from 13-07-2013 to 16-07-2013

2013 **Workshop on slow-fast dynamics: theory, numerics, application to life and earth sciences**. Barcelona (Catalunya) from 03-06-2013 to 07-06-2013.

2013 **Recent Trends in Nonlinear Sciences 2013 (RTNS 2013)**. Murcia (Spain) from 27-01-2013 to 01-02-2013.

2012 **Recent Trends in Nonlinear Sciences 2012 (RTNS 2012)**. Pamplona (Spain) from 23-01-2012 to 27-01-2012.

2011 **Jornades d'Interacció entre Sistemes Dinàmics i EDPs (JISD 2011)**. Barcelona (Catalunya) from 27-06-2011 to 01-07-2011.

2011 **Recent Trends in Nonlinear Sciences 2011 (RTNS 2011)**. Vilanova i la Geltrú (Catalunya) from 24-01-2011 to 28-01-2011.

Didactic training for teaching activity

2017 **The educational evaluation**. Training Course for Teachers in the Primary Education Degree.

2017 **Cooperative learning**. Training Course for Teachers in the Primary Education Degree

2017 **Communicative strategies for teachers**. Training Course for Teachers in the Primary Education Degree.

2017 **Management of activities in Moodle**. Training Course for Teaching Staff.

2013 **Development of scientific texts (I)**. Training Course for Teaching Staff.

2013 **Introduction to social networks: practical applications for teachers and researchers**. Training Course for Teaching Staff.

2013 **Elaboration of video tutorials with Jing and Wink**. Training Course for Teaching Staff.

2013 **Other ways of working in the classroom: Active and collaborative methodologies**. Training Course for Teaching Staff.

2013 **Educational Creativity**. Training Course for Teaching Staff.

2013 **Advanced Moodle. Qualifications**. Training Course for Teaching Staff.

Competitive Grants

2016 **Obra Social La Caixa** to do an stay of research in Københavns Universitet

2010 **Fundació Agrupació Mútua** to study the Master in Advanced Mathematics and Mathematical Engineering.

2008 **Servei de Relacions Internacionals, UIB**. Exchange Program Grant to study a semester in the University ot Texas at Austin (UT).

2005–2010 **Ministeri d'Educació i Cultura (MEC)**. "Beques de caràcter general i mobilitat" to study the mathematical degree, one grant each academic year during the five years degree.

Awards

2018 **First prize for best poster** at the Analysis and Modeling of Complex Oscillatory Systems (AMCOS). C. Vich. Poster Title:*Phasic dopamine influences on action value estimation*.

2014 **Recognition of outstanding student research paper quality and originality in the field of differential equations and dynamical systems**, by The American Institute of Mathematical Sciences (AIMS) at the 10th AIMS Conference on Dynamical systems, Differential Equations and Applications. Paper title: Slow-fast n-dimensional piecewise linear differential systems.

2010 **National Award for Excellence in Academic Performance**, by Universitat de les Illes Balears (UIB). Award to obtain the best expedient of the promotion in the Mathematical Degree.

Tutoring experience

PhD Thesis

2019–present Jordi Penalva Vadell. Neuronal piecewise linear models and their contribution to the bursting behaviour.

2021–present Cristina Giossi. Circuit-level mechanisms of adaptative decision-making

Undergrad Dissertations

2019–2020 Advising the final work of the Degree in mathematics to Nofre Ruiz Salom in collaboration with Dr. Antonio E. Teruel. Title: Model FitzHugh-Nagumo: Relació entre canard maximal i llindar d'activació neuronal.

2017–2018 Advising the final work of the Degree in electrical engineering to Maria González Munar in collaboration with Dr. Rodrigo Picos. Title: Modelling neural networks with Cadence Virtuoso.

Computer skills

Advanced MATLAB

Intermediate C++, JAVA

Languages

Catalan **Mothertongue**

Spanish **Mothertongue**

English **Intermediate**

Others

Member of organizations

2013–2017 Member of the Organization for Computational Neurosciences (OCNS) during the years 2013, 2014, 2015, 2017.

2012–present Member of the thematic network DANCE (Dinàmica, atractores y nonlinealidad. Caos y estabilidad).

2016–present Member of the project ESTALMAT.

2016 Member of the tribunal of the *53a Olimpiada Matemática Española* in the Balearic Islands.

2016 Member of the European Association for Signal Processing (EURASIP).

2015 Member of the European Society for Mathematical and Theoretical Biology (ESMTB).

PhD Tribunals and referees

2021 Member of the tribunal in the PhD thesis of Lucia Pérez Pérez. Thesis title: Dynamical Systems in Neuroscience: the Hindmarsh-Rose model.

2019-present Referee on the annual CNS meeting.