

# Thiago Mosqueiro, PhD

## Curriculum Vitæ

### Contact information

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Affiliation: Life Sciences, University of California Los Angeles

E-mail: [thmosqueiro@ucla.edu](mailto:thmosqueiro@ucla.edu)  
www: [thmosqueiro.vandroiy.com](http://thmosqueiro.vandroiy.com)

Address: 610 Charles E. Young Drive East. Los Angeles,  
Ca 90095, USA

### Work experience

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2017 March -	Postdoctoral researcher at Dptmt Ecology and Evolutionary Biology, UCLA, USA Supervisors: Dr. Noa Pinter-Wollman
2017 March -	Postdoctoral fellow at the Collaboratory, Institute for Quantitative and Computational Biology, UCLA, USA Supervisors: Dr. Matteo Pellegrini
2015 Oct - 2017 Feb	Postdoctoral researcher at BioCircuits Institute, UCSD, USA Supervisors: Dr. Ramon Huerta & Dr. Noa Pinter-Wollman
2016 Sept - Dec	Lecturer at Rady School of Management, UCSD, USA Course: Collecting and Analyzing Financial Data
2015 Jan - March	Junior specialist at Rady School of Management, UCSD, USA Supervisor: Dr. Ramon Huerta
2010 - 2013	Teaching assistant at Institute of Physics of São Carlos, USP, Brazil Worked with Prof. Francisco Alcaraz, Prof. Leonardo Maia, Prof. Rodrigo Pereira, Prof. José Abel Hoyos & Prof. Luis Nunes Disciplines: Statistical Physics, Physics 102 and Computational Physics.

### Education

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August, 2015	<b>PhD in Physics</b> , <i>University of São Paulo</i> , São Carlos, Brazil Thesis: "Information processing in sensory neural networks" Advisor: Dr. Leonardo P Maia
March 2015	<b>Research internship</b> , <i>University of California San Diego</i> , La Jolla, USA Advisor: Dr. Ramon Huerta
February 2011	<b>Masters in Physics</b> , <i>University of São Paulo</i> , São Carlos, Brazil Thesis: "Optical transitions in Zincblende semiconductors heterostructures" Advisor: Dr. Esmerindo Bernardes
December 2008	<b>Bachelor of Physics</b> , <i>University of São Paulo</i> , São Carlos, Brazil

### Grants and awards

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2017 - 2018	Collaboratory fellowship, QCB - UCLA
2015 - 2017	Microsoft Azure Research grant (MS-AZR-0036P)
2015 - present	CNPq PDE fellowship
2014 - 2015	CAPES PSDE fellowship

2014	Selected IOP paper for novelty & impact
2013	Yvone Mascarenhas award for best Teaching assistant
2012 – 2013	USP PAE fellowship (teaching assistant)
2009	Best article award (The LaTeX Community)

## Peer-reviewed publications

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### Papers in refereed journals

1. Thiago Mosqueiro , Martin Strube-Bloss, Brian Smith, and Ramon Huerta, “Solving divergent-convergent synaptic architectures to accelerate stable recognition in multilayered sensory systems,” **Under review.**, 2017.
2. Julia J. Mack, Mosqueiro, Thiago , and et al., “Notch1 is an endothelial mechanosensor in adult arteries that regulates junctional integrity through modulation of calcium signaling and limits atherosclerosis,” **Accepted with minor changes.**, 2017.
3. Thiago Mosqueiro, Chelsea Cook, Ramon Huerta, Jürgen Gadau, Brian Smith, and Noa Pinter-Wollman, “Task allocation and site fidelity jointly influence foraging regulation in honeybee colonies,” **Royal Society Open Science**, vol. 4, no. 8, p. 170 344, 2017. doi: [10.1098/rsos.170344](https://doi.org/10.1098/rsos.170344).
4. Ramon Huerta, Thiago Mosqueiro , Jordi Fonollosab, Nikolai F Rulkova, and Irene Rodriguez-Lujan, “Online decorrelation of humidity and temperature in chemical sensors for continuous monitoring,” **Chemometrics and Intelligent Laboratory Systems**, vol. 157, pp. 169–176, 2016. doi: [10.1016/j.chemolab.2016.07.004](https://doi.org/10.1016/j.chemolab.2016.07.004).
5. Rafael F. Guariento, Thiago Mosqueiro , Paulo Matias, Vinicius B. Cesarino, Lirio O. B. Almeida, Jan F. W. Slaets, Leonardo P. Maia, and Reynaldo D. Pinto, “Automated pulse discrimination of two freely-swimming weakly electric fish and analysis of their electrical behavior during a dominance contest,” **Journal of Physiology – Paris**, vol. In press, 2017. doi: [10.1016/j.jphysparis.2017.02.001](https://doi.org/10.1016/j.jphysparis.2017.02.001).
6. Jose Maria Amigo, Thiago Mosqueiro , and Ramon Huerta, “Predicting Synchronization of Three Mutually Inhibiting Groups of Oscillators with Strong Resetting,” **Journal of Applied Mathematics and Information Science**, vol. 9, no. 5, pp. 2245–2256, 2015. doi: [10.12785/amis/090505](https://doi.org/10.12785/amis/090505).
7. Jacob ZBeal, Traci Haddock-Angelli, Markus Gershater, Kim de Mora, Meagan Lizarazo, Jim Hollenhorst, Randy Rettberg, and iGEM Collaboration , “Reproducibility of Fluorescent Expression from Engineered Biological Constructs in E. coli,” **PLOS ONE**, vol. 11, no. 3, e0150182, 2016. doi: [10.1371/journal.pone.0150182](https://doi.org/10.1371/journal.pone.0150182).
8. Thiago Mosqueiro , Luis de Lecea, and Ramon Huerta, “Control of sleep-to-wake transitions via fast amino acid and slow neuropeptide transmission,” **New Journal of Physics**, vol. 16, no. 11, p. 115 010, 2014. doi: [10.1088/1367-2630/16/11/115010](https://doi.org/10.1088/1367-2630/16/11/115010).
9. Thiago Mosqueiro and Ramon Huerta, “Computational models to understand decision making and pattern recognition in the insect brain,” **Current Opinion in Insect Science**, vol. 6, no. i, pp. 80–85, 2014. doi: [10.1016/j.cois.2014.10.005](https://doi.org/10.1016/j.cois.2014.10.005).
10. Thiago Mosqueiro and Leonardo Maia, “Optimal channel efficiency in a sensory network,” **Physical Review E**, vol. 88, no. 1, p. 12 712, 2013. doi: [10.1103/PhysRevE.88.012712](https://doi.org/10.1103/PhysRevE.88.012712).

### Conference papers & Talks (peer reviewed)

1. Thiago Mosqueiro , Martin Strube-Bloss, Rafael Tuma Guariento, Reynaldo Pinto, Brian Smith, and Ramon Huerta, “Non-parametric change point detection for spike trains,” in *2016 Annual Conference on Information Science and Systems (CISS)*, IEEE, 2016, pp. 545–550, isbn: 978-1-4673-9457-4. doi: [10.1109/CISS.2016.7460561](https://doi.org/10.1109/CISS.2016.7460561).
2. Jaqueline J Brito, Thiago Mosqueiro , Ricardo R Ciferri, and Cristina DA Ciferri, “Faster cloud Star Joins with reduced disk spill and network communication,” in *2016 International Conference on Computational Science (ICCS)*, Procedia of Computational Science, 2016. doi: [10.1016/j.procs.2016.05.299](https://doi.org/10.1016/j.procs.2016.05.299).

3. Rafael T Guariento, Thiago Mosqueiro, Angel A Caputi, and Reynaldo Pinto, "A simple model for electrocommunication: "refractoriness avoidance response"?", Suppl 1, vol. 15, 2014, P68. doi: [10.1186/1471-2202-15-S1-P68](https://doi.org/10.1186/1471-2202-15-S1-P68).
4. Leonardo Maia and Thiago Mosqueiro, "Structural features beneath neuronal avalanches," Suppl 1, vol. 14, 2013, O18. doi: [10.1186/1471-2202-14-S1-018](https://doi.org/10.1186/1471-2202-14-S1-018).
5. Thiago Mosqueiro, Camilo Akimushkin, and Leonardo Maia, "Dynamical aspects of Kinouchi-Copelli model: emergence of avalanches at criticality," in *DINCON*, vol. 1, Águas de Lindoia, 2011, pp. 251–254. doi: [10.5540/DINCON.2011.001.1.0064](https://doi.org/10.5540/DINCON.2011.001.1.0064).

## Invited talks

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2016	UAM, Madrid (Spain)	Stable discrimination in accentuated divergent-convergent neural networks using data from electronic noses
2016	Elche (Spain)	Insect olfaction and multimodal processing of information
2016	HALO, Austin (USA)	Fast and stable discrimination in divergent-convergent neural networks: from Deep Learning back to Neuroscience
2016	SfN, San Diego (USA)	Fast and stable discrimination in accentuated divergent-convergent synaptic connectivities
2016	CISS, Princeton (USA)	Non-parametric change point detection for spike trains
2015	UFABC (Brazil)	Learning in insects: fan-in/fan-out structures
2015	ICMC - USP (Brazil)	On critical phenomena and power laws
2012	IFSC - USP (Brazil)	L <sup>A</sup> T <sub>E</sub> X for thesis and dissertations

## Other professional activities

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Reviewed for	PLOS Computational Biology, Neural Computation, Sensors and Actuator B, Royal Society Interface, Royal Society Philosophical Transactions A, NIPS, Elsevier's Heliyon.
2016	Ad hoc reviewer for <b>National Science Foundation</b>
2015	Participant of Brasil-USP iGEM team (gold badge)
2013, 2015	Judge during the <b>IYPT</b> (finals in Brazil)
2009 – 2015	Developed open L <sup>A</sup> T <sub>E</sub> X thesis class for IFSC
2012	Developed JAQue (Joomla Academic Queries, closed source)

## Teaching experience

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2017 (Spring)	Invited lecture, EEB, UCLA
2017 (Spring)	Introduction to Unix (Collaboratory Workshop), QCBio, UCLA
2016 (Fall)	Lecturer for MGTF 415 Collecting & Analyzing Financial Data, Rady School, UCSD
2015 (Fall)	Invited lecture in Collecting & Analyzing Financial Data – Dr. Ramon Huerta, Rady School, UCSD
2015 (Winter)	Helped teaching Collecting & Analyzing Financial Data – Dr. Ramon Huerta, Rady School, UCSD
2010 – 2013	TA for Statistical Mechanics – with Dr. Francisco Alcaraz, IFSC, USP
2012	TA for Physics 102 – with Drs. PL Maia, JA Hoyos & L Nunes, IFSC, USP
2013	TA for Computational Physics – Dr. Francisco Alcaraz, IFSC, USP

## Outreach

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- 2016 Advisor for a brazilian iGEM team (silver badge)
- 2016 Volunteer at Building With Biology Festival (Reuben Fleet Science Center, San Diego, CA USA)
- 2015 Conducted a large poll on Participation of Women in Brazilian Science, which was part of the 2015 iGEM project (gold badge). Results are publicly available
- 2014 Volunteer in Mozilla Software Carpentry bootcamp (Dr. Andrea Zonca), hosted by the San Diego Super Computer Center, UCSD
- Since 2015 Interaction with PyLadies Brazil, a group focused on balancing gender inequalities in Computer Science areas
- 2012 Contributed in the solutions to problems from IYPT for the brazilian team

## Publicly available datasets

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- 2017 Recordings of beehavioral persistence of honey bees. Published at FigShare.  
DOI: [10.6084/m9.figshare.3619779.v1](https://doi.org/10.6084/m9.figshare.3619779.v1)
- 2016 Recordings from two electric fish swimming freely. Published at FigShare.  
DOI: [10.6084/m9.figshare.3831969.v1](https://doi.org/10.6084/m9.figshare.3831969.v1)
- 2016 Gas sensors for home activity monitoring Data Set. Published at the UCI Machine Learning Repository  
URL: <http://archive.ics.uci.edu/ml/datasets/Gas+sensors+for+home+activity+monitoring>
- 2015 pVeg promoter in E. Coli (iGEM 2015). Published in FigShare.
- 2015 GFP recordings from three different promoters from the Anderson Library (2015 Interlab Experiment). Published in FigShare.

## Other information

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### Languages

Native	Brazilian Portuguese
Fluent	(American) English
Intermediary	Italian, German and Japanese

### Programming languages and Computer Skills

<b>Fluent</b>	C, C++, Fortran, Python, GAWK, and Unix bash shell
High-level languages	Matlab, R, Maple
Version control	Git, Mercurial, Fossil, GitHub
Web oriented	PHP, HTML, Javascript, Jekyll, Bootstrap
Databases	SQL, MySQL, Postgree, Apache Hadoop framework

## Abstracts in conferences

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1. Thiago Mosqueiro , Martin Strube-Bloss, Brian Smith, and Ramon Huerta, *Fast and stable discrimination in accentuated divergent-convergent synaptic connectivities*, in *Society for Neuroscience Annual Meeting (San Diego, CA, USA)*, 2016.

2. Rafael T Guariento, Thiago Mosqueiro, Paulo Matias, Lirio OB Almeida, and Reynaldo D Pinto, *Dynamics of electrical behavior of gymnotus carapo electric fish during dominance contest*, in *Society for Neuroscience Annual Meeting (San Diego, CA, USA)*, 2016.
3. Thiago Mosqueiro, Martin Strube-Bloss, Brian Smith, and Ramon Huerta, *Accelerated information transmission with stable sparse code in strongly divergent-convergent feedforward networks*, in *Twelfth International Neural Coding Workshop (Cologne, Germany)*, 2016.
4. Thiago Mosqueiro, Martin Strube-Bloss, Brian Smith, and Ramon Huerta, *Divergent-convergent synaptic connectivities accelerate coding in multilayered sensory systems*, in *25th Annual Computational Neuroscience Meeting – CNS 2016 (Jeju, South Korea)*, 2016.
5. Thiago Mosqueiro, Martin Strube-Bloss Martin, Rafael Tuma Guariento, Reynaldo Reynaldo Pinto, Brian Smith, and Ramon Huerta, *Non-parametric change point detection for spike trains*, in *2016 Workshop on Information Theory and Applications, San Diego (ITA)*, 2016.
6. Thiago Mosqueiro, Luis de Lecea, and Ramon Huerta, *Employing different time scales in the control of sleep-to-wake transitions*, in *2016 MURI Winter School, San Diego (UCSD)*, 2016.
7. Thiago Mosqueiro and Leonardo Maia, *Information dynamics in the kinouchi-copeli model*, in *School on Biological Complex Networks (Natal, Brazil)*, 2013.
8. Thiago Mosqueiro and Leonardo Maia, *Optimal channel efficiency in a sensory network*, in *Criticality in Neural Systems Symposium, Bethesda (NIH, US)*, 2012.
9. Thiago Mosqueiro and Leonardo Maia, *Information flow in a network of excitable units*, in *Granada Seminar (Granada, Spain)*, 2012.
10. Thiago Mosqueiro and Leonardo Maia, *Information dynamics in the kinouchi-copeli model*, in *Experimental Chaos and Complexity Conference (Michigan, US)*, 2012.