Ulises Pereira

CONTACT INFORMATION

The University of Chicago
Department of Statistics
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RESEARCH INTERESTS

Theoretical Neuroscience and Machine Learning.

EDUCATION

The University of Chicago, Chicago, IL

Ph.D., Statistics, *Expected:* Fall 2018

- Thesis Disertation: *Unsupervised Learning of Spatiotemporal Attractors In Neural Networks*
- Advisor: Nicolas Brunel, Ph.D

M.S., Statistics, Aug 2015

Universidad de Chile, Santiago, Chile.

Magister, Physics, September 2013

- Thesis Topic: *Nonlinear Dynamics*
- Advisor: Enrique Tirapegui, Ph.D
- *W*ith Highest Distinction.

Ingeniería, Molecular Biotechnology, June 2013

- *W*ith Highest Distinction. Ranked first out of eight graduates (1/8).

Licenciatura, Physics, June 2012

- *W*ith Distinction. Ranked first out of six graduates (1/6).

REFEREED JOURNAL PUBLICATIONS

1. **Pereira U**, Coullet P. and Tirapegui E. The Bogdanov-Takens Normal Form: A Minimal Model for Single Neuron Dynamics. Entropy. 2015.
2. Vera J., Pezzoli M., **Pereira U.**, Bacigalupo J. and Sanhueza M. Electrical Resonance in the θ Frequency Range in Olfactory Amygdala Neurons. Plos One. 2014.
3. Contreras D., **Pereira U.**, Hernández V., Reynaert B. and Letelier J.C. A loop conjecture for metabolic closure. *Advances in Artificial Life, ECAL 2011.* MIT press. 2011. Selected one of the ten best papers of ECAL 2011.
4. Jaramillo S., Honorato-Zimmer R., **Pereira U.** , Contreras D., Reynaert B., Hernández V., Soto-Andrade J., Cárdenas M.L., Cornish-Bowden A. and Letelier J.C. (M,R) Systems and RAF Sets: Common Ideas, Tools and Projections. *Artificial life XII.* MIT press. 2010.

PAPERS IN PREPARATION

1. **U. Pereira**, J. Aljadeff, and N. Brunel. Chaos with Associative Memory Properties in Attractor Neural Network.
2. **U. Pereira** and N. Brunel. Inferred Learning Rules From IT Cortex Are Optimal for Memory Storage.
3. **U. Pereira** and N. Brunel. Unsupervised Learning of Persistent and Sequential Activity.

Honors and Awards

- **Doctoral Becas-Chile Scholarship**. Chilean Government. *Commission of Research in Science and Technology of the Chilean Government (CONICYT). 2013*. Scholarship declined.
- **Doctoral Fulbright Fellowship**. U.S. Government. *Fulbright commission . 2012*.
- **Best Physics Student of Class 2011**. Universidad de Chile. *Department of Physics. 2011*.
- **CONICYT Master Fellowship**. Chilean Government. *Commission of Research in Science and Technology of the Chilean Government (CONICYT). 2011*. Ranked 5/1584 at national level.
- **Bicentenario Scholarship for Undergraduate Studies**. Chilean Government. *Ministry of Education. 2004*.
- **Scholarship for Outstanding Score in PSU**. *PSU (Spanish acronym) is the national Chilean university selection test.* Pontifical Catholic University of Chile. *2004*. Scholarship declined.

Conference Posters

Pereira U. and Brunel N. Optimal Unsupervised Hebbian Learning Rules For Attractor Neural Networks. COSYNE Poster Presentation. Salt Lake City, EEUU. February, 2017.

Pereira U. and Brunel N. Unsupervised Learning of Persistent and Sequential Activity. COSYNE Poster Presentation. Salt Lake City, EEUU. February, 2016.

Pereira U. and Brunel N. Unsupervised Learning of Sequential Activity. XV International Workshop on Instabilities and Nonequilibrium Structures. Valparaíso, Chile. December, 2015.

Vera J., **Pereira U.**, Reynaert B., Bacigalupo J. and Sanhueza M. Modulation of frequency preference by changes in input resistance. 44th Annual Meeting Society for Neuroscience. Washington D.C., USA. November, 2014.

Vera J., **Pereira U.**, Reynaert B., Deichler A., Astudillo D., Bacigalupo J., and Sanhueza M. A biological context for theta-frequency neuronal resonance: a comparative study between cortical amygdala and hippocampal neurons. X Annual meeting of the Chilean Society for Neuroscience. October, 2014. Valdivia, Chile. **Awarded for best panel presentation.**

Pereira U., Tirapegui E. Una Ecuación Universal Para la Dinámica Neuronal. In Proceedings of the XVII Conference on Nonequilibrium Statistical Mechanics and Nonlinear Physics. Santiago, Chile. December 2012.

Pereira U., Tirapegui E. Una Ecuación Universal Para la Dinámica Neuronal. In Proceedings of the XVIII Simposio Chileno de Física. La Serena, Chile. November, 2012.

Pereira U., Vera J., Pezzoli M., Bacigalupo J. and Sanhueza M. A computational conductance-based model that reproduce theta resonance dynamics in olfactory amygdala neurons.*41st Annual meeting of the Society for Neuroscience.* Washington DC, EEUU. November, 2011.

Vera J, **Pereira U.**, Pezzoli M., Bacigalupo J. and Sanhueza M. Sub and supra-threshold dynamics of resonant neurons in the olfactory amygdala.*41st Annual meeting of the Society for Neuroscience.* Washington DC, EEUU. November, 2011.

Contreras D, **Pereira U.**, Hernández V., Reynaert B. and Letelier J.C..A loop conjecture for metabolic closure.*Eleventh European Conference on the Synthesis and Simulation of Living Systems.* Paris, France. August, 2011.

Pereira U., Pezzoli M., Bacigalupo J., Sanhueza M.. A computational conductance-based model of electrical resonance in the theta frequency range in olfactory amygdala neurons. VI meeting of the Chilean Society of Neuroscience. Valdivia, Chile. September, 2010.

Jaramillo S., Honorato-Zimmer R., **Pereira U.**, Contreras D., Reynaert B., Hernández V., Soto-Andrade J., Cárdenas M.L., Cornish-Bowden A. and Letelier J.C. (M,R) Systems and RAF Sets: Common Ideas, Tools and Projections. *XII Artificial life Conference*. Odense, Denmark. August, 2010.

Teaching Experience

Instructor

- **Statistical Models and Methods**. The University of Chicago. *Winter 2015*.

Teaching Assistant

- **Theoretical Neuroscience: Network Dynamics and Computation**. The University of Chicago. *Winter 2017*
- **Statistical Methods and Applications**. The University of Chicago. *Fall 2016*.
- **Statistical Methods and Applications**. The University of Chicago. *Fall 2015*.
- **Statistical Models and Methods**. The University of Chicago. *Spring 2015*.
- **Elementary Statistic**. The University of Chicago. *Fall 2014*.
- **Statistical Methods and Applications**. The University of Chicago. *Spring 2014*.
- **Theoretical Neuroscience: Network Dynamics and Computation**. The University of Chicago. *Winter 2013*
- **General Physiology**. Universidad de Chile. *Autumn Semester 2010*
- **Biological Instrumentation**. Universidad de Chile. *Spring Semester 2008*.

Courses

- **Latin American Summer School in Computational Neuroscience**. Institute of Complex Systems. *Valparaíso, Chile. 11 to 29 January, 2010*.
- **VI Summer School of Complex Systems**. Institute of Complex Systems. *Valparaíso, Chile. 7 to 11 of January, 2008*.