

# LUCA HERR-TTI

HERRANZ CELOTTI

## Brand New Researcher

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## EXPERIENCE

### PhD student in Machine Learning

#### Multi-sensory Dialogue

- April 2016 – Ongoing      Université de Sherbrooke, Canada
- Supervisor: Jean Rouat
  - Subject: incremental and multimodal vocabulary acquisition for a simulated agent dialogue interaction with a human
  - Funds from European CHIST-ERA, project IGLU <https://iglu-chistera.github.io/>
  - Hierarchical Reinforcement Learning for multitasking
  - Courses on "Advanced Signal Processing" and "Reinforcement Learning" taken, and on "Bio-inspired AI" given
  - Talks given in international conferences, several papers published, major training events attended

### Internship in Computational Neuroscience

#### Uncertainty Propagation in Population Coding

- October 2014 – October 2015      Université de Génève, Switzerland

- Supervisor: Alexandre Pouget
- how the probabilistic population coding hypothesis can explain the way the brain deals with uncertainty, by means of Bayesian inference, dynamic programming, drift diffusion models and information theory tools, such as Fisher information and differential correlations
- lectures taken on "Introduction to cognitive and affective neuroscience" and "Biological modelling of neural networks" with Wulfram Gerstner

### Master in Biophysics

#### Information Transfer between Neurons

- October 2012 – October 2013      Universidad Autónoma de Madrid, Spain

- Supervisor: Nestor Parga
- final grade: 2nd best among 14 students, 87,8
- grant "Ayudas para Inicio de Estudios en Programas de Posgrado de la UAM": the whole Master, a yearlong language course and a monthly wage
- Master Thesis on an Information Theory analysis of neural signals: "Information transfer during a perceptual decision task"

### Erasmus Scholarship

#### Directed Networks for Citation Graphs

- October 2011 – October 2012      Imperial College of London, United Kingdom

- yearlong Project on Graphs: "A dimensional analysis on directed networks for citation graphs"
- course on "Biophysics of neurons" taken

### Undergraduate in Physics

#### Theoretical Physics

- October 2007 – October 2012      Universidad Autónoma de Madrid, Spain

- final grade: 9th best among 64 students, 81,7%
- Maths (Topology, Differential Geometry, Group Theory, Graphs) and Psychology lectures taken

## MOST PROUD OF

🏆 Courage I had moving to the cities where things are happening

❤ Persistence & Loyalty in finding opportunities to perfect my craft

📈 Winning Competitions a drone won against 400 people in machine learning

## STRENGTHS

Hard-working  
Persuasive  
Motivator & Leader  
Team Worker  
Curiosity  
Linux  
Latex  
GitHub  
Python  
Reinforcement Learning  
Deep Learning  
Spiking Networks  
TensorFlow  
Keras



## LANGUAGES

English  
Italian  
Spanish  
French  
German  
Chinese  
Arabic



"Quality is not an act, it is a habit"

Aristotle

## PUBLICATIONS

### Articles

- Brodeur, S., Perez, E., Anand, A., Golemo, F., Celotti, L., Strub, F., Rouat, J., Larochelle, H., and Courville, A. (2018). “**HoME: a Household Multimodal Environment**”. In: *ICLR Workshop Paper*.
- Celotti, L., Brodeur, S., and Rouat, J. (2018). “**Language coverage and generalization in RNN-based continuous sentence embeddings for interacting agents**”. In: *Visually Grounded Interaction and Language (ViGIL) 2018, NeurIPS Workshop*.
- Brodeur, S., Celotti, L., and Rouat, J. (2017). “**Proposal of a Generative Model of Event-based Representations for Grounded Language Understanding**”. In: *Proc. GLU 2017 International Workshop on Grounding Language Understanding*, pp. 68–72.

## WORKSHOPS & SEMINARS

2010	VII Curso de Iniciación a la Investigación IEM CSIC, Madrid (Spain)
2011	Relativity meets Entanglement and High Energy Workshop Imperial College of London, London (United Kingdom)
	Swiss Machine Learning Day 2014 EPFL, Lausanne (Switzerland)
	Swiss Computational Neuroscience Seminar (Maass & Daw) Universität Bern, Bern (Switzerland)
2014	Talk given at Pouget's lab on Eliasmith's SPAUN project Université de Génève, Geneva (Switzerland)
2015	Swiss Computational Neuroscience Seminar (Sabes & Churchland) Université de Génève, Geneva (Switzerland)
2016	Machine Learning Summer School Kyoto University, Kyoto (Japan) entry contest second prize winner, a drone
2017	High Performance Computing Summer School Bishop University, Sherbrooke (Canada)
2018	NIPS conference Centre Convencions Internacional, Barcelone (Spain)
2019	Interspeech conference Stockholm University, Stockholm (Sweden)
	Grounded Language Understanding Workshop KTH, Stockholm (Sweden)
	Deep Learning & Reinforcement Learning Summer School University of Toronto, Toronto (Canada)
	NeurIPS conference Palais des Congrès de Montréal, Montreal (Canada)

## SKILLS

- Strong analytical and problem solving skills
- Physics background means ordinary and stochastic differential equations, graphs, probabilities, signal processing, thermodynamics, electronics, general modelling and programming among others
- Deep and spiking neural networks knowledge on subjects such as population coding, nonlinear dynamics and learning algorithms
  - Practical knowledge on feedforward and recurrent networks, GANs, attractor dynamics and techniques such as backpropagation, spike-time-dependent plasticity or holographic reduced representations
- Statistics knowledge on subjects such as parametric and non-parametric Bayesian inference, Markov Decision Processes (MDP), and techniques such as expectation propagation
- Machine Learning knowledge on convex optimization, Deep Neural Networks, Reinforcement Learning and techniques such as Random Forest Classifiers and Gradient Boosting Regressors
- Interpersonal skills in different contexts such as Master students' delegate, team work, engaging people in presentations and how to interpret doubts to boost learning as a teacher

## OTHERS

- Passionate reader
- Playing football (soccer), even if now I do it seldom, gives me the opportunity to be creative at understanding spaces and actions, peoples rhythms at moving, their personal understanding of movement, their weaknesses and strengths, while working towards the team's common goals.
- Exploration of different musical instruments like the violin, the guitar, the piano and the drums. I was also a drummer in a Samba band
- I volunteered two summers with a CSIC researcher in Physics, on “Bohmian Trajectories”
- Hitchhiking 4 000km in a year means holding myself responsible and finding enjoyment in looking for creative solutions
- I like to elicit randomness, as a sparkle for creativity, look for the unexpected and learn from it

## REFEREES

**Prof. Jean Rouat**  
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**Prof. Ugo Bastolla**  
@ ubastolla@cbm.uam.es