

Laura Dubreuil-Vall

Curriculum Vitae

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Research interests

Neuroscience, neurophysiology, executive functions, non-invasive brain stimulation, cognitive neuroscience, artificial intelligence, machine learning, deep learning.

Education

- 2015–Present **PhD in Neuroscience**, *joint PhD program between University of Barcelona and Harvard Medical School, Boston, MA.*
- 2009-2011 **MSc in Telecommunications Engineering**, *Polytechnic University of Catalonia (UPC), BarcelonaTech School of Telecommunications Engineering (ETSETB), Barcelona, Spain, GPA: 8.27/10. Ranked third student of the class out of 226 students.*
- 2006-2009 **BSc in Telecommunications Engineering**, *Polytechnic University of Catalonia (UPC), BarcelonaTech School of Telecommunications Engineering (ETSETB), Barcelona, Spain, GPA: 8.25/10. Ranked first student of the class out of 226 students.*

Professional experience

- Sept. 2014 **Neuroelectrics** | Research Scientist
-Present
Designed a deep learning system based on brain signals to predict what patients will develop Parkinson's disease 6 years in advance with 88% accuracy.
Improved the robustness of a wearable medical device for EEG recording and non-invasive brain stimulation by reducing the effect of external interferences.
Lead the expansion of the company to the US, creating a new team and generating more than \$3M revenues.
- Sept. 2015 **Massachusetts General Hospital, Harvard Medical School** | Visiting PhD fellow
-Present
Designed an experimental and quantitative analysis framework of behavioral and physiological data for the extraction of biomarkers for ADHD using deep learning techniques, statistical analysis and signal processing.
Created a pipeline to extract meaningful physiological features for the neuromodulation of executive functions in healthy and ADHD populations.
Published 2 book chapters and more than 10 peer-reviewed publications in high-impact medical journals such as Brain Stimulation and Frontiers in Neurology.
- July 2012 - **Starlab** | Research Engineer in neuroscience
August 2014
Designed a Brain-Computer Interface (BCI) based on EEG and non-invasive brains stimulation techniques to aid patients with post-stroke motor recovery.
- October 2011 **Ernst & Young** | Consultant in life sciences
- April 2012
Strategic and management consulting in life sciences industries, including biotechnology, healthcare, pharma and medical devices.

- February 2011 **Massachusetts Institute of technology (MIT)** | Research scholar
- August 2011 Design of an underwater acoustic video transmission system under the supervision of Dr. Chrystostomos Chrystostomidis.
- July 2009 - **Institute of Photonic Sciences (ICFO)** | Intern
Sept. 2009 Explored the fundamental aspects of quantum theory to enable the implementation of applications requiring specific types of quantum light.

Publications

Journals

- [1] G. Ruffini, D. Ibanez, M. Castellano, **L. Dubreuil-Vall**, A. Soria-Frisch, R. Postuma, J. Gagnon, J. Montplaisir. Deep Learning With EEG Spectrograms in Rapid Eye Movement Behavior Disorder. *Frontiers in Neuroscience* (2019), <https://doi.org/10.3389/fneur.2019.00806>
- [2] **L. Dubreuil-Vall**, P. Chau, A. Widge, G. Ruffini, J. Camprodon. tDCS to the left DLPFC modulates cognitive and physiological correlates of executive function in a state-dependent manner, *Brain Stimulation* (2019), <https://doi.org/10.1016/j.brs.2019.06.006>
- [3] **L. Dubreuil-Vall**, P. Chau, A. Widge, G. Ruffini, J. Camprodon. Electrophysiological mechanisms of tDCS modulation of executive functions. *Brain Stimulation*. 10(4):e26 (2017). <https://doi.org/10.1016/j.brs.2017.01.213>
- [4] Putrino, D., Climent, A., **Dubreuil Vall, L.**, Ruffini, G., Labar, D., Edwards, D., Cortes, M. (2017). Motor evoked potential changes in response to transcranial direct current stimulation correlate with quantitative EEG changes in subjects with chronic spinal cord injury. *Brain Stimulation*, 10(4), pp. e41-e42. <https://doi.org/10.1016/j.brs.2017.04.077>
- [5] Cortes, M., Climent, A., Putrino, D., **Dubreuil Vall, L.**, Ruffini, G., Labar, D., Edwards, D. J. (2017). The effects of transcranial direct current stimulation in chronic spinal cord injury: a quantitative EEG study. *Brain Stimulation*, 10 (2) , p.371. <https://doi.org/10.1016/j.brs.2017.01.094>
- [6] **Dubreuil Vall, L.**, Cortes, M., Edwards, D., Ruffini, G., Putrino, D. (2017). EEG recordings during sham control transcranial direct current stimulation protocol. *Brain Stimulation*, 10(1), pp. e13. <https://doi.org/10.1016/j.brs.2016.11.060>

Conferences

- [7] C. R. Bennet, **L. Dubreuil-Vall**, J. Leite, G. Ruffini, L. Merabet. Deployment of a Mobile Wireless EEG System to Record Brain Activity Associated with Physical Navigation in the Blind: A Proof of Concept. *Proceedings of the 2nd International Conference on Intelligent Human Systems Integration (IHSI 2019)*, February 7-10, 2019, San Diego, California, USA.
- [8] D. Ibanez, **L. Dubreuil-Vall**, O. Ripolles, A. Riera. BrainSurfer: A Novel Neurofeedback Tool for ADHD Training. *Proceedings of Amrita Bioquest Conference, Vallikavu (India)*, (2013).
- [9] **L. Dubreuil Vall**, D. Sura, M. Stojanovic. Towards Underwater Video Transmission, *Proceedings of Workshop on Underwater Networks*, Seattle, Washington, US (2011). <https://doi.org/10.1145/2076569.2076573>
- [10] R. Ahmed, **L. Dubreuil Vall**, M. Stojanovic and R. Narayanaswami. Video Transmission Over an In-Air Acoustic Link, *Workshop on Underwater Networks*, Seattle, Washington (2011).

Book chapters

- [11] Anton Albajes-Eizagirre, **L. Dubreuil-Vall**, David Ibanez, Alejandro Riera, Aureli Soria-Frisch, Stephen Dunne, and Giulio Ruffini. Quantitative EEG for Brain-Computer Interfaces, in "EEG/ERP analysis" (pages 157-174). CRC Press, ISBN: 978-1138077089 (2014)
- [12] **L. Dubreuil-Vall**. Electroencephalography (EEG). In "Principles of Neuroimaging. Guide to the clinic and research", Editorial Medica Panamericana, in press

Awards and Fellowships

- 2019 **Women in STEM**, *National Spanish award to outstanding professional and academic excellence for women in STEM.*
- 2011 **Third best student award**, *2011 BarcelonaTech graduating class, MSc in Telecommunications Engineering.*
- 2010 **AGAUR**, *Spanish National fellowship for master thesis stay at a US university.*
- 2009 **Catedra Everis - Best student award**, *2009 BarcelonaTech graduating class, BSc in Telecommunications Engineering.*
- 2009 **Caixa Catalunya**, *Summer fellowship for internship at Institute of Photonic Sciences.*
- 2005 **Caixa Manresa**, *Full college tuition fellowship for best high school students.*
- 2005 **Spanish Baccalaureate award (high school)**, *Technology Specialization, Escola Pia Sabadell, GPA: 9.2/10.*

Coursework

- 2019 **Deep Learning nanodegree** | Udacity
Neural Networks, Convolutional Networks, Recurrent Neural Networks, Generative Adversarial Networks, Deep Reinforcement Learning
- 2016 **Computational Neuroscience** | University of Washington
Representation of information by spiking neurons, processing of information in neural networks, algorithms for adaptation and learning
- 2016 **Machine Learning** | Stanford University
Supervised learning, unsupervised learning, learning theory, reinforcement learning and adaptive control

Technical Skills

Programming PYTHON, MATLAB, SQL, R, L^AT_EX

Languages

- English Full professional fluency
- Catalan Native speaker
- Spanish Native speaker