# Cecilia Aguerrebere


**Contact Information**

Av. Italia 6201
11300, Montevideo, Uruguay
Ceibal Foundation

*Voice:* (+598) 2601 5773 ext 227
*E-mail:* caguerrebere@ceibal.edu.uy,
*Web:* http://aguerreb.github.io/


**Current Position**

**Ceibal Foundation**, Montevideo, Uruguay **July 2016 - present**
Research Scientist

I conduct research on learning analytics and educational data mining for Ceibal Foundation, a governmental institution created to provide guidance to Plan Ceibal, and other national and international educational actors, in aspects related to education and technology. Plan Ceibal is a national policy program that has been implemented over the last ten years in Uruguay. It provides a personal device (laptop or tablet) to all students in the K-12 public education system (over 85% of the children in the country), as well as internet connectivity to all public schools and a wide variety of online educational resources and platforms.

**Education**

**Ph.D. in Applied Mathematics and Electrical Engineering** 2011 - 2014
Télécom ParisTech, France and
Universidad de la República, Uruguay (joint Ph.D. program)
Advisors: Prof. Julie Delon, Prof. Yann Gousseau and Prof. Pablo Musé.

**MSc. "Mathematics, Vision and Learning"** 2010 - 2011
École Normale Supérieure de Cachan, France

**MSc. Electrical Engineering** 2009 - 2011
Universidad de la República, Uruguay
Advisors: Prof. Julie Delon and Prof. Pablo Musé.

**Electrical Engineering Degree** 2001 - 2006
Universidad de la República, Uruguay

**Research Experience**

**Duke University**, Durham, USA 2014 - 2016
Postdoctoral Researcher
Electrical and Computer Engineering Department (with Prof. Guillermo Sapiro).

**Allen Institute for Brain Science**, Seattle, USA February 2016
Research Collaboration (with Prof. Stephen Smith)

**National Institutes of Health (NIH)**, Bethesda, USA December 2015
Research Collaboration (with Dr. Alberto Bartesaghi)
At Dr. Sriram Subramaniam's Laboratory at the National Cancer Institutes, NIH.

**École Normale Supérieure de Cachan**, Cachan, France September 2015
Research Collaboration (with Prof. Jean-Michel Morel)
Centre de Mathématiques et de Leurs Applications

**Universidad de la República**, Montevideo, Uruguay 2008 - 2010
Research Assistant
Electrical Engineering Department

PUBLICATIONS

**Ph.D. Dissertation**

C. Aguerrebere, *On the Generation of High Dynamic Range Images: Theory and Practice from a Statistical Perspective*, Télécom ParisTech, UdelaR, 2014.

**Journal Articles**

1. *Atomic resolution cryo-EM structure of beta-galactosidase*, Alberto Bartesaghi, Cecilia Aguerrebere, Veronica Falconieri, Soojay Banerjee, Lesley Earl, Xing Zhu, Nikolaus Grigorieff, Jaqueline Milne, Guillermo Sapiro, Xiongwu Wu, Sriram Subramaniam. Structure, 2018.

2. *Probabilistic fluorescence-based synapse detection.*, Anish K. Simhal, Cecilia Aguerrebere, Forrest Collman, Joshua T. Vogelstein, Kristina D. Micheva, Richard J. Weinberg, Stephen J. Smith, and Guillermo Sapiro. PLoS Computational Biology 13, no. 4 (2017).

3. *A Bayesian Hyperprior Approach for Joint Image Denoising and Interpolation, with an Application to HDR Imaging*, Cecilia Aguerrebere, Julie Delon, Andrés Almansa, Yann Gousseau, Pablo Musé, IEEE Transactions on Computational Imaging, 2017.

4. *Building capacity for learning analytics in Latin America*, Cristóbal Cobo and Cecilia Aguerrebere. Learning Analytics for the Global South, Digital Learning for Development, 2017.

5. *Fundamental Limits in Multi-image Alignment*, Cecilia Aguerrebere, Mauricio Delbracio, Alberto Bartesaghi, Guillermo Sapiro, IEEE Transactions on Signal Processing 64.21 (2016): 5707-5722, 2016.

6. *Practical High Dynamic Range Imaging of Everyday Scenes: Photographing the world as we see it with our own eyes.* Pradeep Sen and Cecilia Aguerrebere. IEEE Signal Processing Magazine 33.5: 36-44, 2016.

7. *Simultaneous High Dynamic Range and Super-Resolution Imaging Without Regularization*, Yann Traonmilin and Cecilia Aguerrebere. SIAM Journal on Imaging Sciences 7.3 1624-1644, 2014.

8. *Best algorithms for HDR image generation: A study of performance bounds*, Cecilia Aguerrebere, Julie Delon, Yann Gousseau, Pablo Musé. SIAM Journal on Imaging Sciences, 7 (2014), pp. 1-34.

9. *Exemplar-based Texture Synthesis: the Efros-Leung Algorithm*, Cecilia Aguerrebere, Yann Gousseau and Guillaume Tartavel. Image Processing On Line, vol. 3, pp. 223-241, 2013, doi 10.5201/ipol.2013.59

**Articles in Peer-Reviewed Conferences**

1. *How Should Online Teachers of English as a Foreign Language (EFL) Write Feedback to Students?*, Cecilia Aguerrebere, Monica Bulger, Cristóbal Cobo, Sofía García, Gabriela Kaplan and Jacob Whitehill. International Conference on Educational Data Mining. Montréal, Canada, 2019.

2. *Do Learners Know What's Good for Them? Crowdsourcing Subjective Ratings of OERs to Predict Learning Gains*, Jacob Whitehill, Cecilia Aguerrebere and Benjamin Hylak. International Conference on Educational Data Mining. Montréal, Canada, 2019.

3. *Unveiling Wi-Fi Usage Profiles: A First Look at a K-12 Education Service Provider*. Germán Capdehourat, Cecilia Aguerrebere, Federica Bascans, Germán Álvarez, Pedro Porteiro. 22nd IEEE Global Internet Symposium, INFOCOM, 2019.

4. *Scaling Learning Analytics up to the national level: the experience from Estonia and Uruguay*, Adolfo Ruiz Calleja, Sofía García, Kairit Tammets, Cecilia Aguerrebere, Tobias Ley. 2da Conferencia Internacional en Analíticas de Aprendizaje en Latinoamérica, 2019.

5. *Estimating the Treatment Effect of New Device Deployment on Uruguayan Students' Online Learning Activity*, Cecilia Aguerrebere, Cristóbal Cobo and Jacob Whitehill. International Conference on Educational Data Mining. Buffalo, NY, 2018.

6. *Exploring Feedback Interactions in Online Learning Environments for Secondary Education*, Cecilia Aguerrebere, Sofía García Cabeza, Gabriela Kaplan, Cecilia Marconi, Cristóbal Cobo and Monica Bulger. 1ra Conferencia Internacional en Analíticas de Aprendizaje en Latinoamérica, 2018.

7. *Strategies for data and learning analytics informed national education policies: the case of Uruguay*, Cecilia Aguerrebere, Cristóbal Cobo, Marcela Gómez, Matías Mateu. International Learning Analytics & Knowledge Conference. Vancouver, BC, Canada, 2017.

8. *Single Shot High Dynamic Range Using Piecewise Linear Estimators*, Cecilia Aguerrebere, Julie Delon, Andrés Almansa, Yann Gousseau, Pablo Musé. International Conference on Computational Photography. Santa Clara, CA, U.S, 2014.

9. *Simultaneous HDR image reconstruction and denoising for dynamic scenes*, Cecilia Aguerrebere, Julie Delon, Yann Gousseau, Pablo Musé. International Conference on Computational Photography. Boston, Massachusetts, U.S, 2013.

10. *A-contrario localization of epileptogenic zones in SPECT images*, Cecilia Aguerrebere, Pablo Sprechmann, Pablo Mus'e, Rodolfo Ferrando. IEEE International Symposium on Biomedical Imaging, Boston, Massachusetts, U.S, 2009.

11. *Aguará: An Improved Face Recognition Algorithm through Gabor Filter Adaptation*, Cecilia Aguerrebere, Germán Capdehourat, Mauricio Delbracio, Matías Mateu, Alicia Fernández, Federico Lecumberry. IEEE Workshop on Automatic Identification Advanced Technologies, AutoID 2007, Alghero, Italy, 2007.

## Selected Talks and Seminars

1. *Data for Learning how to Teach and Learn*, Khipu, Latin American Meeting in Artificial Intelligence. Montevideo, Uruguay, November 2019.

2. *Estimating the Treatment Effect of New Device Deployment on Uruguayan Students' Online Learning Activity*, International Conference on Educational Data Mining. Buffalo, NY, July 2018.

3. *Big Data for Education at Plan Ceibal*, Workshop on Big and Complex Data Theory, Applications and Value Creation, Montevideo, Uruguay, May 2018.

4. *A practical guide to multi-image alignment*, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Calgary, Alberta, Canada, April 2018 (poster).

5. *Strategies for data and learning analytics informed national education policies: the case of Uruguay*, International Learning Analytics & Knowledge Conference. Vancouver, BC, Canada, March 2017.

6. *Dose Fractionated Cryo-EM Images: Advances and Fundamental Limits in Movie Alignment*, SIAM Conference on Imaging Science, Albuquerque, New Mexico, USA, May 2016.

7. *Fundamental Limits in Multi-image Alignment*, Invited talk, Allen Institute for Brain Science, Seattle, USA, February 2016.

8. *Query Based Probabilistic Synapse Detection in Array Tomography*, Neuroscience 2016, Society for Neuroscience, San Diego, USA, November 2016 (poster).

9. *Computational tools in big data*, Modeling and data analysis for the healthy human global project (MISP, Institut Pasteur), Punta del Este, Uruguay, December 2015.

10. *Direct detector movie processing: Frame Alignment*, 12th Annual Lab Retreat, Center for Cancer Research, National Institutes of Health (NIH), Bethesda, MD, U.S., October 2015.

11. *Inverse problems in imaging: an hyperprior Bayesian approach with an application to single image HDR*, IEEE International Conference on Computational Photography (ICCP), Rice University, Houston, TX, U.S., abril 2015 (poster).

12. *Single Shot High Dynamic Range Using Piecewise Linear Estimators*, IEEE International Conference on Computational Photography (ICCP), Intel, Santa Clara, CA, U.S., May 2014.

13. *High dynamic range imaging from a single shot*, SIAM Conference on Imaging Science, Hong Kong, May 2014 (poster).

14. *High Dynamic Range Imaging*, Invited talk, Dept. Electrical and Computer Engineering, Duke University, Durham, NC, U.S., November 2013.

15. *Simultaneous HDR image reconstruction and denoising for dynamic scenes*, IEEE International Conference on Computational Photography (ICCP), Harvard University, Boston, MA, U.S., April 2013.

16. *Algorithmes optimaux pour la génération d'images HDR. Une étude des bornes de performance*, Colloques sur le Traitement du Signal et des Images (Gretsi), Brest, France, September 2013 (poster).

## Honors & Awards

- **Postdoctoral fellowship**, "Fondo Prof. Dr. Roberto Caldeyro Barcia", Agencia Nacional de Investigación e Innovación (ANII), 2015.
- **Associated Researcher (candidate)**, Sistema Nacional de Investigadores, Uruguay, since 2014
- **Doctoral fellowship**, "Allocation de recherche", (Télécom ParisTech), 2011.
- **Best Engineering Master Thesis**, Uruguayan National Academy of Engineering, 2011.
- **Master fellowship**, Agencia Nacional de Investigación e Innovación (ANII), 2009.

## Teaching Experience

**Duke University**, Durham, USA 2015 - 2016
Teaching Assistant for Coursera online course *"Image and video processing: From Mars to Hollywood with a stop at the hospital"*, by Prof. Guillermo Sapiro.

*Graduate students supervision*
Anish Simhal, *"Synapse detection in array tomography images".*

**Télécom ParisTech**, Paris, France 2011 - 2014
Teaching Assistant, Dept. of Signal and Image Processing

**Universidad de la República**, Montevideo, Uruguay 2008 - 2010
Teaching Assistant, Dept. Electrical Engineering
Academic Advising (advisor of Electrical Engineering Undergraduate's Degree Thesis)

## Professional Experience

**Ledefyl S.A.** 2005 - 2009
Telecommunications Engineer
GSM/GPRS network operation and maintenance for Antel, Uruguay (2005 - 2009)
CDMA network deployment, operation and maintenance for Open Mobile, Puerto Rico (2007)
LAN/WAN network administration at Ledefyl S.A. (2005 - 2009).

## Service to Profession

**Reviewer for journals:** Image Processing On Line (IPOL), SIAM Journal on Imaging Sciences, IEEE Transactions on Signal Processing, IEEE Transactions on Image Processing, IEEE Transactions on Multimedia, Transactions on Graphics, Signal Processing: Image Communication, Journal of Learning Analytics.

**Reviewer for:** International Learning Analytics & Knowledge Conference (2010, 2019, 2018), Conferencia Latinoamericana de Analticas de Aprendizaje, LALA (2019, 2018), Congreso Iberoamericano de Reconocimiento de Patrones, CIARP (2015, 2014), Conferencia Latinoamericana en Informática, CLEI (2013).

## Technical Skills

Python, Matlab, R, UNIX Shell scripting. Familiar with: C/C++

## Personal Information

**Nationality:** Uruguayan

**Languages:** Spanish (native language), English (fluent), French (fluent)