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/

Personal Information

Place / Date of birth: Montevideo, Uruguay / August 27th, 1982
Nationality: Uruguayan

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.

M2 - MVA: Mathématiques, Vision, Apprentissage — 2010 - 2011
École Normale Supérieure de Cachan, France

Electrical Engineering Master Degree, March 2011 — 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
Image Processing Group

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 Graduate'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).

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. *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.

2. *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.

3. *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.

4. *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.

5. *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.

6. *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.

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

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

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

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

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

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

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

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

9. *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.

10. *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).

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

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

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

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

15. *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.

Service to Profession

Reviewer for journals: Image Processing On Line, SIAM Journal on Imaging Sciences, IEEE Transactions on Signal Processing, IEEE Transactions on Image Processing, IEEE Transactions on Multimedia.

Reviewer for: International Learning Analytics & Knowledge Conference (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++

Languages

Spanish (native language)

English (fluent)

French (fluent)