Pol del Aguila Pla

Personal data

Place and date of birth:	Barcelona, Catalonia, on 13 September 1990
Home address:	Carl Malmstens väg 8, Lgh 1103, Solna, Sweden
Mobile phone:	+46 (0)7-294-29302
Email:	poldap@kth.se
Website:	poldap.github.io

Research experience

2019 Aug – 2014 Sept | Ph.D. Thesis [Expected]

Inverse problems in signal processing: Functional optimization, parameter estimation and machine learning

Division of Information Science and Engineering, School of Electrical Engineering and Computer Science, KTH Royal Institute of Technology, Stockholm, Sweden. Supervisor: **Prof. Joakim Jaldén**.

2014 Sept – 2014 Mar | Research Engineer

Probability density estimation, a review of the state of the art.

Department of Signal Processing, School of Electrical Engineering, KTH Royal Institute of Technology, Stockholm, Sweden. Supervisor: **Prof. Joakim Jaldén**.

2014 Mar – 2013 Aug | Master's thesis

Normalization of remote sensing imagery for automatic information extraction

Department of Communication Theory, School of Electrical Engineering, KTH Royal Institute of Technology, Stockholm, Sweden. Supervisors and examiner: **Dr. Felipe Calderero, Prof. Ferran Marqués and Prof. Markus Flierl**.

2012 Aug – 2012 Apr | Undergraduate research

Image analysis for sport events classification, a review of the state of the art.

Image Processing Group (GPI), Department of Signal Theory and Communications (TSC), *Escola Tècnica Superior d'Enginyeria de Telecomunicació de Barcelona*, UPC BarcelonaTech. Supervisor: **Prof. Ferran Marqués**.

University education

2014 Mar – 2012 Aug | *Civilingenjör*, 5-year degree in **Electrical Engineering**

KTH Royal Institute of Technology, School of Electrical Engineering, Stockholm, Sweden. Heavily specialized in signal processing and its applications to communications and imaging. Double degree program.

2014 Mar – 2008 Sep | *Enginyer de Telecomunicació*, 5-year degree in **Telecommunications Engineering**

UPC BarcelonaTech, *Escola Tècnica Superior d'Enginyeria de Telecomunicació de Barcelona*, Barcelona, Catalonia. Specialized in signal processing and its applications to pattern recognition and speech processing. Double degree program.

Publications

[1] P. del Aguila Pla, V. Saxena, and J. Jaldén, "SpotNet – Learned iterations for cell detection in image-based immunoassays," in *2019 IEEE 16th International Symposium on Biomedical Imaging (ISBI 2019)*, April 2019. Access at http://arxiv.org/abstract/1810.06132

[2] P. del Aguila Pla and J. Jaldén, "Cell detection by functional inverse diffusion and non-negative group sparsity – Part I: Modeling and Inverse problems," *IEEE Transactions on Signal Processing*, vol. 66, no. 20, p. 5407–5421, 2018. Access at http://urn.kb.se/resolve?urn=urn:nbn:se:kth:diva-233824

[3] ——, "Cell detection by functional inverse diffusion and non-negative group sparsity – Part II: Proximal optimization and Performance evaluation," *IEEE Transactions on Signal Processing*, vol. 66, no. 20, p. 5422–5437, 2018. Access at http://urn.kb.se/resolve?urn=urn:nbn:se:kth:diva-233827

[4] ——, "Cell detection on image-based immunoassays," in *2018 IEEE 15th International Symposium on Biomedical Imaging (ISBI 2018)*, April 2018, p. 431–435. Access at http://urn.kb.se/resolve?urn=urn:nbn:se:kth:diva-223933

[5] ——, "Convolutional group-sparse coding and source localization," in *2018 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, April 2018, p. 2776–2780. Access at http://urn.kb.se/resolve?urn=urn:nbn:se:kth:diva-224253

[6] P. del Aguila Pla, F. Calderero, F. Marqués, J. Marcello, and F. Eugenio, "Fast generation of lulc maps for temporal studies in north-western africa," in *2014 IEEE International Geoscience and Remote Sensing Symposium (IGARSS 2014)*, 2014, p. 4280–4283. Access at http://urn.kb.se/resolve?urn=urn:nbn:se:kth:diva-157117

[7] P. del Aguila Pla, J. Jaldén, K. Magnusson *et al.*, "Method and system for analysing fluorospot assays," Swedish Patent Request, 2017.

Grants and awards

2019 Jan – 2017 Sep — Travel grants. Total amount ≈ 64200 SEK ≈ 7 k$.
Malme's foundation **travel grant** through the EECS school at KTH, KTH Opportunities Fund **project scholarship**, Knut and Alice Wallenberg Jubilee appropriation **travel grant**, Åforsk Foundation **travel grant** and Engineering Sciences 2017 call from The Royal Swedish Academy of Sciences (KVA, call ES2017-0011) **project and travel grant**.

2013 Mar – 2012 Aug — Exchange studies scholarships
Erasmus and **AGAUR**[1] exchange studies scholarships.

2009 Jun – 2008 Sep — Promotion's top-10 award. Ranked 4^{th}.
Receiver of the UPC BarcelonaTech award for **first year students with top-10 grades** in Telecommunications Engineering.

Participation in the scientific community

2019 Jan — 7 Jan - 7 Feb, Research visit at **Professor Jean-Luc Starck**'s group (**CosmoStat**).
Department of Astrophysics, **CEA Paris-Saclay**, Paris, France

14 and 28 Jan, presentations at **Cosmostat** and **Parietal**, **NeuroSpin**, **INRIA**, respectively, titled *Cell detection by functional inverse diffusion and non-negative group sparsity - Biology, physics, math and engineering*, access at `www.cosmostat.org`.

2018 Jul — Attendance to the *Thirty-fifth International Conference on Machine Learning* (**ICML 2018**).
Stockholmsmässan, Stockholm, Sweden.

2018 Jun — Poster presentation within the *SIAM Conference on Imaging Science* (**SIAM-IS 2018**), titled **Source localization by spatially variant blind deconvolution**, access at `www.siam-is18.dm.unibo.it`.
University of Bologna, Bologna, Italy.

2018 Apr — Poster presentation within the *IEEE International Conference on Acoustics, Speech and Signal Processing* (**ICASSP 2018**), titled **Convolutional group-sparse coding and source localization**, access at `sigport.org`.

[1] Catalan Agency for Management of University and Research Grants

Calgary Talus Convention Centre, Calgary, Alberta, Canada.

9 - 13 Apr, Research visit at **Professor Stephen P. Boyd's group**.
10 Apr, Presentation to the group titled *Cell detection by functional inverse diffusion and non-negative group sparsity.*
Information Systems Laboratory, Department of **Electrical Engineering, Stanford University**, Stanford, California, United States of America

Poster presentation within the *2018 IEEE* 15^{TH} *International Symposium on Biomedical Imaging* (**ISBI 2018**), titled **Cell detection on image-based immunoassays**.
Omni Shoreham Hotel, Washington, D.C., United States of America.

2017 Nov | Oral presentation within the workshop *Generative models, parameter learning, and sparsity* (VMVW02), titled **Cell detection by functional inverse diffusion and group sparsity**, access at `downloads.sms.cam.ac.uk`.
Isaac Newton Institute for Mathematical Sciences, **University of Cambridge**, Cambridge, United Kingdom.
Within the programme *Variational methods and effective algorithms for imaging and vision.*

Current
2015 Aug | Reviewer for the **IEEE Transactions on Signal Processing**

Teaching experience

Current
2017 Feb | **Supervision of Master's and Bachelor's thesis**
Main supervisor of a master's thesis, [1]. Designer of two bachelor's thesis projects, attracting 5 different groups of two students. Main supervision for 2 of them, i.e., [2, 3], and co-supervisor for the remaining three, i.e., [4, 5, 6].

Current
2014 Sept | **Teaching assistance in the course EQ2300: Digital Signal Processing**
Taught every year Nov – Dec by Prof. Joakim Jaldén and one to three assistants. Approximate numbers: 120 h of guidance of exercise sessions and lectures, 140 h of class preparation, 45 h of course and material development, 100 h of grading of projects and exams, and 20 h of private tutoring.

Supervised theses

[1] D. Jones, "Automated rodent sleep analysis with modern machine learning methods," Master's thesis, KTH Royal Institute of Technology, 2018. Access at http://urn.kb.se/resolve?urn=urn:nbn:se:kth:diva-229398

[2] G. Bengtsson and J. Larsson, "Source localization by inverse diffusion and convex optimization [Project: Large scale optimization on a GPU]," Bachelor's Thesis, KTH Royal Institute of Technology, 2018. Access at http://urn.kb.se/resolve?urn=urn:nbn:se:kth:diva-230738

[3] J. Sörell and E. Ågeby, "Inverse diffusion by proximal optimization with TensorFlow [Project: Large scale optimization on a GPU]," Bachelor's Thesis, KTH Royal Institute of Technology, 2018. Access at http://urn.kb.se/resolve?urn=urn:nbn:se:kth:diva-239369

[4] L. Colérus and K. Rehn, "Automatic sleep scoring using Keras [Project: Machine learning for sleep scoring]," Bachelor's Thesis, KTH Royal Institute of Technology, 2018. Access at http://urn.kb.se/resolve?urn=urn:nbn:se:kth:diva-230905

[5] J. Malmström and N. Yavari, "Power spectral density based sleep scoring using artificial neural networks [Project: Machine learning for sleep scoring]," Bachelor's Thesis, KTH Royal Institute of Technology, 2018. Access at http://urn.kb.se/resolve?urn=urn:nbn:se:kth:diva-239371

[6] D. Ekvall and R. Winqvist, "Machine learning for sleep scoring [Project: Machine learning for sleep scoring]," Bachelor's Thesis, KTH Royal Institute of Technology, 2018. Access at http://urn.kb.se/resolve?urn=urn:nbn:se:kth:diva-239372

Languages

Mother tongue (C2+): Catalan and Spanish
Professional (C2): English
Conversational (B2): Swedish
Basic (A1-A2): Italian and French (DELF A2, 2006 Aug)

Other skills

Technical skills:	Experienced in the administration of GPU-enabled Linux computational servers. Experienced in the maintenance of websites for academic groups. Professional in electronic design and measurement, network testing and simulation, measurement of digital communications systems, and antenna design and performance analysis.
Programming:	C/C++, Java, R, Python, TensorFlow, Bash, Matlab, LaTeX
Soft skills:	Social and friendly collaborator. Accomplished and praised supervisor of student theses and teacher of exercise sessions. Very attentive to detail. Experienced in industy - academia collaborations.

Interests and activities

Linux, Free / Libre / Open-source software. Open-access research and open science. Philosophy and sociology.
Regular opera-goer, moderate cinephile, initiated tap-dancer and avid reader.
Hiking enthusiast and ex-capoeira practicioner.