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 Sept 2014 Sept	**Ph.D. Thesis** *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 and J. Jaldén, "Inferences from quantized data — Likelihood logconcavity," *In preparation*, 2019.

[2] P. del Aguila Pla, L. Pellaco, S. Dwivedi, P. Händel, and J. Jaldén, "Clock synchronization over networks — Identifiability of the sawtooth model," *In preparation*, 2019.

[3] 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 HTTPS://ARXIV.ORG/ABS/1810.06132

[4] 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

[5] ——, "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

[6] ——, "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

[7] ——, "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

[8] 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

[9] P. del Aguila Pla, J. Jaldén, K. Magnusson *et al.*, "Method and system for analysing fluorospot assays," International Patent Application, 2017. Access at HTTPS://PATENTS.GOOGLE.COM/PATENT/WO2019004913A1

IMPACT CASE - PATENT AND PRODUCT

The technology developed in [4, 5], protected by [9], was implemented by Mabtech AB and Quamcom Research & Technology AB, resulting on a successful product for biomedical researchers by the name of Mabtech IRIS (https://www.mabtech.com/iris). References at Mabtech AB: **Dr. C. Smedman** and **Prof. Staffan Paulie**.

GRANTS AND AWARDS

2019 Mar 2017 Sep	**Travel grants.** Total amount ≈ 78 kSEK ≈ 8.4 k\$. Gålöstiftelsen study **travel grant**, 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 4TH. Receiver of the UPC BarcelonaTech award for **first year students with top-10 grades** in Telecommunications Engineering.

PARTICIPATION IN THE SCIENTIFIC COMMUNITY

Current 2019 Mar	Reviewer for **Elsevier Signal Processing**
Current 2015 Aug	Reviewer for the **IEEE Transactions on Signal Processing**
2019 Apr	12-13 Apr, Invited participant in the 2019 IEEE Signal Processing Society (SPS) Long Range Planning Meeting

---

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

LECTURE PRESENTATION (9 APR) WITHIN THE *2019 IEEE* 16$^{\text{TH}}$ *International Symposium on Biomedical Imaging* (**ISBI 2019**), TITLED **SpotNet — Learned iterations for cell detection in image-based immunoassays**, ACCESS AT embs.papercept.net.
HILTON MOLINO STUCKY, VENICE, ITALY.

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 AND team.inria.fr/parietal.

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.
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$^{\text{TH}}$ *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 | LECTURE 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*.

TEACHING EXPERIENCE

Current | SUPERVISION OF MASTER'S AND BACHELOR'S THESIS (SEE BELOW)
2017 FEB | MAIN SUPERVISOR OF TWO MASTER'S THESIS, [1] AND ONE ONGOING. DESIGNER OF TWO BACHELOR'S THESIS PROJECTS, ATTRACTING 5 DIFFERENT GROUPS OF TWO STUDENTS. MAIN SUPERVISION FOR 2 BACHELOR'S THESIS [2, 3], AND CO-SUPERVISOR FOR SIX, [4, 5, 6] AND THREE ONGOING.

2018 DEC | TEACHING ASSISTANCE IN THE COURSE **EQ2300: Digital Signal Processing**
2014 SEP | 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 academia–industry 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.