Jaume de Dios Pont

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Curriculum Vitae

Education

2018 – **PhD. Mathematics**, *University of California, Los Angeles*.

2017 – 2018 **MS. Mathematics**, *Eidgenössiche Tecnische Hochschule Zürich*, .
Master Thesis: Quantum Loewner Evolution, *supervised by E. Powell and W. Werner*

2012 – 2017 **BS. Mathematics**, *Autonomous University of Barcelona*, Grade: 9.71/10, (#1 Rank).

2016 – 2017 **Exchange Program**, *University of California los Angeles*, .
Bachelor Thesis: Oscillatory integrals and the Kakeya Conjecture, *supervised by J. Garnett, J. Verdera*

2012 – 2017 **BS. Physics**, *Autonomous University of Barcelona*, Grade: 9.62/10, (#1 Rank).
Bachelor Thesis: Design of KCM-related experiments *supervised by F. X. Álvarez, A. Lopeandía*

Scolarships

2018–2020 **Beca 'La Caixa'**.
Granted the 'La Caixa' scolarship to pursue graduate studies in the US starting August 2018. The scolarship covers full tuition and a stipend for the first two years of the graduate program. Obtained the highest score given by the selection commitee.

2017 - 2018 **Excellence Scolarship**, *ETH Zurich*.
Granted the Excellence scolarship for the Master in Mathematics, wich covers tuition, living costs, and a special mentorship program.

Publications

2021 **A polynomial curve partitioning theorem over local fields with applications to harmonic analysis**, In preparation.

2021 **On classical inequalities for autocorrelations and autoconvolutions**, *Joint work with J. Madrid*, Preprint, https://arxiv.org/abs/2106.13873.

2020 **Decoupling for fractal subsets of the parabola**, *Joint work with A. Chang, R. Greenfeld, A. Jamneshan, Z.K. Li, J. Madrid*, Preprint, https://arxiv.org/abs/2012.11458.

2020 **A geometric lemma for complex polynomial curves with applications in Fourier restriction theory**, Preprint, arXiv:2003.14140.

2020 **On Sparsity in Overparametrised Shallow ReLU Networks**, *Preprint*, arXiv:2006.10225.

2019 **Role Detection in Bicycle-Sharing Networks Using Multilayer Stochastic Block Models**, *Joint work with J. Carlen, C.Mentus, S. Chang, S. Wang and M. Porter*, Preprint, arXiv:1908.09440.

2017 **Noise removal and feature extraction of 2D CT radiographic images**, *Joint work with S. Harizanov and D. Wenzel*, Conference: 11th Annual Meeting of the Bulgarian Section of SIAM, At Sofia, Bulgaria, Volume: Advanced Computing in Industrial Mathematics, SCI Springer .

Talks

Mar 2021 **Decoupling for Cantor sets**, *Online workshop on Fourier restriction and related topics.*.

Feb 2021 **Uniform boundedness in operators parametrized by polynomial curves**, *UC Davis Student-Run Analysis & PDEr*.

Dec 2020 **Decoupling and applications: from PDEs to Number Theory**, *OARS Seminar*.

Nov 2020 **Uniform boundedness in operators parametrized by polynomial curves: Local field case**, *UB-UAB analysis seminar*.

Oct 2020 **On Sparsity in Overparametrised Shallow ReLU Networks**, *NYU Math and Data group Meeting*.

Oct 2020 **Decoupling and applications: from PDEs to Number Theory**, *BGSMATH - SIMBa Seminar*.

Undergraduate research experience

2017 **GNAM**, *Grup de Nanomaterials, UAB*.
Research on the GNAM phyisics Group. Designed experiments to measure heat conduction beyond the scope of the Fourier equations at the Nanoscale, with a focus on the KCM diffusion model. At the moment the designed experiments are being performed in GNAM.

2016 **ICFO**, *Summer Fellowship of the Institute of Photonic Sciences*.
Research fellow in the group of Antonio Acín (Quantum Information). The main focus of my research was the creation of supperpositions of unknown quantum states. I proved that such creation is impossible even under more general circumstances that it was previously known, and studied the situation where more than one copy is given. Supervisor: Dr. Michal Oszmaniec

2015 **The Dark Energy Survey Project**, *IFAE- Institute for High Energy Physics*.
Short time intern in the Dark Energy Survey Project. My main goal was to perform numerical computations in python, in order to study the soundness of theoretical models regarding the harmonic spectrum of galaxy density distributions. Supervisor: Dr. Ramon Miquel

Contests and Awards

2017 **Datafest**, *Data analysis contest*, Los Angeles.
First position in one of the most prestigious data science undergraduate competitions, data visualization category. Sponsoring company and data provider: Expedia.

2014-2016 **COMAP MCM**, *Team UAB*.
Took part for three consecutive years in the "COMAP modelling contest", a 96h international mathematics modeling contest. Remarkable results include "Meritorious Participant" team award as well as the 1st position for European teams.

Computer skills

Languages & Frameworks

- **Python**
  High emphasis in scientific computations, image processing and scientific data analysis. Expertise using the scientific stack (scipy, numpy, statsmodels..), knowledge of Jax ,Torch and TensorFlow.
- **MatLab/SciLab:**
  Relevant work includes ODE/PDE scientific simulation, image processing of microscopical Brownian Motion data and image processing for Computational Tomography scans.
- **R**
  Statistical data analysis, hypothesis testing, parameter estimation, data visualization
- **Javascript+HTML5+CSS**
  Programmed Chrome Apps, websites, and phone games. Can use node.js.
- **C / C++**
  High performance numerical simulations (using LAPACK/CUDA)
- **PHP** (and LAMP set-up)
  Programmed the back-end for web-apps and games, as well as for some projects in a Raspberry Pi.
- **LabView** (basic)
  Programmed interfaces for data acquisition in nanocalorimetry, developed a python interface for a preexisting labview module.

Miscellaneous Software

- LaTeX
- COMSOL
- Gnuplot
- GIT

Languages

Catalan	**Mothertongue**	
Spanish	**Mothertongue**	
English	**Fluent**	*CAE Advanced/ TOEFL 108/120*
French	**Intermediate**	*Conversationally fluent*
German	**Intermediate**	*B1*

Research and Academic Interests

- Harmonic analysis
- Theory of Machine Learning
- Numerical Analysis
- PDEs