Pablo Pascual Cobo

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Research Interests

Information Theory, Coding Theory, Communications, High-Dimensional Estimation, Compressed Sensing, Statistical Learning.

Research and Education

PhD — Churchill College, **University of Cambridge**, Oct 2020 – Feb 2025

Spatial Coupling for High-Dimensional Estimation

- Supervised by **Prof. Ramji Venkataramanan**.
- Applied information-theoretic and coding techniques to tackle high-dimensional estimation problems.
- Derived novel approximate message passing algorithms for generalized linear models, large user networks and group testing.

BA MEng — Churchill College, **University of Cambridge**, Engineering, Oct 2016 – Jun 2020

- Specialized in **Information Engineering**.
- Courses included: Information Theory, Control, Computer Vision, Image Processing, Statistical Signal Analysis, Optimization.
- MEng Thesis: *Algorithms for Matrix Estimation*, First Class.

English School of Asturias, Pruvia de Abajo, Asturias, Spain, Sept 2004 - Jun 2016

- 5 International A Levels at grade A*.

Work Experience

University of Cambridge, Undergraduate Teaching — Cambridge, UK, Oct 2020 – Mar 2025

- Small group supervisions (2-4 students) and examples classes (15-25 students) to 3rd year Engineering undergraduate students, courses on **Information Theory and Coding** and **Data Transmission**.
- Supervised **Audio Modem** 3rd year practical project, 2nd year Spectrum Analysis and Data Science labs.

Roku Inc., Software Engineer Intern — Cambridge, UK, Jun 2019 – Sept 2019

- Took part in a project to develop a new operating system for TVs.
- Developed new software for the TV's tuner user interface.
- Learned to use project management tools such as JIRA or Confluence and worked on Brightscript and C programming languages.

Maths Builders, UROP project, Cambridge University Engineering Department — Cambridge, UK, Jul 2017 – Sept 2017

- Developed content for a mobile app to help GCSE Maths students.

Publications

P. Pascual Cobo, K. Hsieh, and R. Venkataramanan. Bayes-optimal estimation in generalized linear models via spatial coupling. IEEE Transactions on Information Theory, 70 (11):8343–8363, 2024.

P. Pascual Cobo, K. Hsieh, and R. Venkataramanan. Bayes-optimal estimation in generalized linear models via spatial coupling. In Proc. IEEE International Symposium on Information Theory, pages 773–778, 2023.

Xiaoqi Liu, **Pablo Pascual Cobo**, and Ramji Venkataramanan. Many-user multiple access with random user activity: Achievability bounds and efficient schemes, 2024. [arXiv preprint]

Xiaoqi Liu, **Pablo Pascual Cobo**, and Ramji Venkataramanan. Many-user multiple access with random user activity. In Proc. IEEE International Symposium on Information Theory, 2024.

Nelvin Tan, **Pablo Pascual Cobo**, Jonathan Scarlett, and Ramji Venkataramanan. Approximate message passing with rigorous guarantees for pooled data and quantitative group testing. SIAM Journal on Mathematics of Data Science, 6(4):1027–1054, 2024.

Nelvin Tan, **Pablo Pascual Cobo**, and Ramji Venkataramanan. Quantitative group testing and pooled data in the linear regime with sublinear tests, 2024. [arXiv preprint]

Nelvin Tan, **Pablo Pascual Cobo**, and Ramji Venkataramanan. Quantitative group testing and pooled data with sublinear number of tests. International Zurich Seminar on Information and Communication, 2024.

Reviewer: IEEE Transactions on Information Theory, IEEE Transactions on Signal Processing, IEEE International Symposium on Information Theory (ISIT)

Scholarships and Awards

EPSRC Doctoral Training Partnership PhD Studentship award

Churchill College scholar 2018, 2019, honorary scholar in 2020.

Additional Skills and Hobbies

Languages: Fluent in English and Spanish and advanced level of French

Programming Languages: Python, C++, Matlab, Brightscript

Sports (football, basketball, tennis) lover, avid **reader** and **traveler**

Referees

Prof. Ramji Venkataramanan (rv285@cam.ac.uk, Department of Engineering, Cambridge)

Prof. Albert Guillén i Fàbregas (albert.guillen@eng.cam.ac.uk, Department of Engineering, Cambridge)

Mr Pete Boyt (pboyt@roku.com, Project manager at Roku Inc., 2 Cambridge Science Park Rd, Cambridge CB4 0AF)