

Bernat Guillen Pegueroles

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Professional Statement: Applied and Computational Mathematics Ph.D. student specializing in Data Analysis, Topological Data Analysis and Manifold Learning, looking for experiences at the interface of mathematical research, software development and data analysis. Interested in using Mathematics for Good.

Education

Princeton University, Princeton, NJ Anticipated Spring 2019.
Ph.D. in Applied and Computational Mathematics. GPA: 4.0/4.0. Fulbright Scholar.

Universitat Politècnica de Catalunya, Barcelona, Spain September 2007 - July 2013
Double BS/MS in Applied Mathematics and Electrical Engineering. GPA: 3.3/4.0.
Prized for best academic transcript both in BS and MS cycle. Merit-based scholarship awarded.

Experience

Research

Princeton University. September 2014-Present.
Graduate Student under Dr. Charles L. Fefferman (since Nov 2015). Co-advised by Dr. Simon Levin.

- Develop and employ algorithms for interpolation and reconstruction of functions and manifolds.
- Develop algorithms for Topological Data Analysis.
- Utilize TDA and Manifold Learning for understanding problems in Global Health, Education, and Microbiome.

Barcelona Biomedical Research Institute, *Molecular Modeling and Bioinformatics group.* September 2013-August 2014:
• Studied physical properties of DNA and nucleosome positioning with computational genomics techniques. Assisted in developing `nucleR`.

Universitat Politècnica de Catalunya. Research Experiences during BS+MS. 2010-2013
• Studied and compared protocols for service allocation in sustainable Data Centers (MS thesis, summa cum laude).
• Developed algorithms for a priori k -anonymity and privacy problems.
• Implemented SDP techniques for studying the Mutually Unbiased Bases problem in Quantum Information Theory.

Coding

C++, C, Python, Julia, R, MATLAB, Java, MPI, OpenMP. [Github](#), [Bitbucket](#)

- `MPImap`, MapReduce implementation on C/MPI for analyzing fault tolerance and performance.
- `dG_project`, implementation of nodal discontinuous Galerkin methods for solving PDE.
- `ADMM-4-block`, conic programming solver with 4 blocks of restrictions.
- Assisted in developing `nucleR`, a bioconductor package used for nucleosome coverage analysis in DNA sequences.

Consulting

- Implemented Data Analysis tools for several non-profit educational initiatives ([GlassFrog](#), [J-PAL](#)).
- Studied impact of educational programs (hierarchical PSM) and socioeconomic factors that effect education (using Neural Networks).

Activities and Interests: Clarinet player.

Teaching Experience: Several years of private tutoring, mentoring, as well as being an Assistant Instructor at Princeton University.

¹Program in Applied and Computational Mathematics
Last updated: December 18, 2016
[Up to date CV](#)[Up to date resume](#)