Seminari Informal
de Matemàtiques de Barcelona

Speaker:	Meritxell Vila Miñana.
University:	Universitat de Barcelona.
Date:	Wednesday, June 21st, 2023.
Schedule:	12:00, *virtual coffee break*; 12:20, talk.
Place:	UB (FMI aula B3) and Zoom.
Language:	English.
Title:	Estimating the dimensionality of complex networks using persistent homology

Abstract: In this work, a new interdisciplinary approach is presented to study the dimensionality of complex networks using techniques from topological data analysis (TDA) through a filtration of graphs by vertex degrees. For each of two real-world complex networks, 30 surrogate graphs were generated in each dimension from 1 to 10, and several TDA descriptors of graphs were compared with the corresponding values for the real networks in order to estimate their latent dimension. Total persistence, Wasserstein distance and scale-space kernel dissimilarity, among other descriptors, yielded consistent outcomes. The results of this study suggest that TDA is sensible to the latent dimension of complex networks, and provide conclusions consistent with those obtained in previous studies.

About us: *SIMBa* is a mathematics seminar organized by graduate students in the Barcelona area. It is aimed towards graduate and last course undergraduate students. Our goals are divulging the knowledge from different branches of mathematics for those interested and promote networking between the attendants.

This seminar is backed by the Faculty of Mathematics and Computer Science at Universitat de Barcelona, Faculty of Mathematics and Statistics at Universitat Politècnica de Catalunya, the Department of Mathematics from Univesitat Autònoma de Barcelona, CRM, IMUB and BGSMath.

Fore more information, visit at `www.ub.edu/simba/en/`.

If you have any doubt or comment do not hesitate to contact us by sending an email to *seminari.simba@gmail.com*.