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# Séminaire conjoint CIRRELT et la Chaire de recherche en apprentissage statistique


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## «Embedding zero-inflated data: A Hilbert space PCA approach»


**Abstract:** A novel principal component analysis method for concentration curves associated with non-negative and zero-inflated random variables is introduced. The proposed methodology relies on a diffeomorphic embedding of these curves into a suitable functional space with a Hilbert structure. This embedding not only enables the use of well-established techniques for Hilbert spaces, but also facilitates the interpretation of the resulting components. In particular, the principal components, and the reconstructions based on them, can be mapped back to the original space of concentration curves, where they retain a direct interpretation. Consistency of the modes of variation is established, both in $L^2(\mathbb{P})$ and almost surely. The approach is illustrated on international trade data, where the leading components separate whether a product is exported from how much of it is exported.


**Biography**: Enea Bongiorno is Associate Professor of Statistics at the Department of Economics and Business Studies (DiSEI), Università del Piemonte Orientale, Novara (Italy). He received his PhD in Mathematics from the Università degli Studi di Milano (Italy). His research is in functional data analysis and mathematical statistics, with a focus on small ball probability, the complexity of functional data, and Hilbert-space methods for non-standard data such as Lorenz curves and zero-inflated measures.

VENDREDI

20 novembre 2026
14 h

Local 2327
Pavillon Palasis-Prince
Université Laval

This talk will be in English

Ouvert à tous

*Café et viennoiseries*

**Organisatrice:**
***Marzia Cremona***

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