

Jeudi 14 décembre 16h15 (CYCL01)

Prof. **Johan Segers** (ISBA - Institut de statistique, biostatistique et sciences actuarielles UCLouvain)

Measuring dependence between random vectors via optimal transport

Abstract: Joint work with Gilles Mordant (Universität Göttingen, formerly UCLouvain). The Wasserstein distance is a metric on the space of probability measures on a common Euclidean space. It relies on the notion of optimal couplings, which formalise the idea of minimizing the cost of transporting mass so as to transform one measure into another. For absolutely continuous measures, the optimal coupling takes the form of a deterministic transformation which satisfies a multivariate form of monotonicity called cyclic monotonicity and which can be loosely described as being the gradient of a convex function. Between centered Gaussian measures, the optimal transport map is linear and is the solution of an interesting matrix equation. We rely on the latter solution to propose a new coefficient of dependence between random vectors of possibly different dimensions. Maximum dependence occurs at the joint covariance matrix with minimal von Neumann entropy under certain constraints. The dependence coefficient can be estimated accurately from data using their component-wise ranks.

Jeudi 25 mai 16h15 – 17h15 (CYCL01)

Prof. **Maria Manuel Clementino** (Université de Coimbra) : *Shuffling groups and topologies using categories*



Abstract: Category theory plays a key role on the unification of results and clarification of their essence, on simplification of proofs, and on the conception of new ideas. This talk intends to present, to a general mathematical audience, instances of each of these facets, having as common ground the study of topological groups and continuous group homomorphisms.

Jeudi 13 avril 16h15 – 17h15 (CYCL01)

Mathematics Colloquium Special edition on *The ecological footprint Of the IRMP researcher*

Mini-talks

- Marc Servais, Chargé de mission développement durable, UCLouvain en Transition
- Pierre-Emmanuel Caprace, IRMP Green Team

Followed by discussion and poll