# Tests of independence based on Bernstein empirical copula and density

## Mohamed Belalia[*]

Mohamed.Belalia@usherbrooke.ca

In this paper we propose a news nonparametric statistical tests of independence between vectors of continuous random variables, based on Bernstein copula processes. After having studied the asymptotic behavior of the Bernstein empirical copula process, the first proposed test will be based on a Cramér-von Mises functional of this process. Thereafter and in the same analogy as in the case precedent, we propose another test of independence, but this time will be based on a functional of Cramér-von Mises of the Bernstein empirical copula density. At the end, and as a third test of independent we will study a test based on the relative entropy (also known as Kullback—Leiber divergence)as measure of association based on the Bernstein copula density. A simulation study shows the performance of the the proposed tests compared with the classical one based on the empirical copula process.

**Keywords**: Bernstein Empirical copula process, Bernstein copula density, Cramér-von Mises statistic, Kolmogorov Smirnov Statistics, Non parametric estimation, Independence test, Hypothesis test.

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[*]Département de mathématiques, Université de Sherbrooke, 2500, boul. de l'Université, Sherbrooke, QC, J1K 2R1, CANADA.