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Abstract. The abstract should briefly summarize the contents of the paper in 150–250 words.

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1 Introduction

2 Copulas

Throughout the remainder of this article, we will denote by $\overline{\mathbb{R}}$ the extended set of real numbers defined as $\overline{\mathbb{R}} = \mathbb{R} \cup \{-\infty, +\infty\}$. Let $\chi = \{X_1, \ldots, X_n\}$ be a set of n continuous random variables and $H(X_1, \ldots, X_n) = \mathbb{P}\left(X_1 \leq x_1, \ldots, X_n \leq x_n\right)$ a cumulative distributive function (CDF) over χ. We denote by lower case x_i a realization of a random variable. Recall that a CDF respects the following properties:

1. For every $\mathbf{x} \in \mathbf{I}^n$,
$$H(\mathbf{x}) = 0 \mathrm{isequaltoa_i}. \tag{1}$$

An n-dimensional copula is then a function C from the n-dimensional unit cube $\mathbf{I}^n = [0,1]^n$ to $[0,1]$ which respects the two following properties:

1. The function C is grounded and n-increasing.

A copula function may also be seen as a distribution function and is consequently of main interest to draw sample from a known distribution law using Monte-Carlo methdods. Moreover, copulas being distributions, we can define a copula density function

Theorem 1 (Sklar 1959). *Let $H(x_1, \ldots, x_n)$ be any multivariate distribution over continuous random variables, there exists a copula function such that*

$$H\left(x_1, \ldots, x_n\right) = C\left(F(x_1), \ldots, F(x_n)\right). \tag{2}$$

Furthermore, if each $F(x_i)$ is continuous then C is unique.

* Supported by organization x.

3 Copula Bayesian Networks

A copula bayesian networks (CBN), as defined by G. Elidan [**?**], is a triplet $(\mathcal{G}, \theta_C, \theta_F)$ where $\mathcal{G}$ is directed acyclic graph (DAG), θ_C a set of copulas and θ_F a set of marginals. As in bayesian networks, a CBN encodes the conditional independencies of a multivariate probability distribution.