

## The minimax copulas

---

NINA RUŽIĆ

*Faculty of Mathematics and Physics  
University of Ljubljana (Slovenia)*

nina.ruzic@fmf.uni-lj.si

The theory of copulas started with Sklar's theorem proposing a universal model for expressing dependence of random variables. With the range of applications in applied mathematics expanding and varying from mathematics of finance to system theory, there is a growing need for new types of copulas that could serve as appropriate models in these applications. It is our aim to set a counterpart to the famous Marshall copulas (an extension of Marshall-Olkin copulas) that are typically applied to model lifetime of a two-component system where components are subject to "shocks". Even a small but essential change in the problem that the model is applied to such a system with one of the components having a backup option leads to possibly quite different copulas. So, it is our goal to construct copulas that model dependence of random variables  $U = \max\{X, Z\}$  and  $V = \min\{Y, Z\}$  where  $X$ ,  $Y$  and  $Z$  are independent random variables. We will present a full study of the augmented case by introducing a new family of copulas, called minimax copulas, together with some of their properties and examples.

This is a joint work with M. OMLADIČ (University of Ljubljana).