

A New Approach for Generating Archimedean Copulas

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Copula functions serve as an advanced tool for characterizing the dependence structure among variables. However, Archimedean copulas, a widely used type, often face limitations due to their dependence structure being governed by a single parameter, constraining modeling flexibility. In this study, we propose a method to enhance the dependence structure by introducing a novel mechanism that adds parameters to the copula function. By augmenting the parameters of the inverse generator of Archimedean copulas with a density function of the dependence parameter, we establish that our extended inverse generator generates a new Archimedean copula, applicable across various copula dimensions. To illustrate the efficacy of our methodology, we expand the parameterization of two and three-dimensional copulas and demonstrate its utility in modeling by fitting such expanded models to electricity peak demand data.

Keywords: Multivariate Archimedean copulas, Dependence structure, Inverse generator, Dependence measures.

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