

# Predictive Inference for Bivariate Data with Nonparametric Copula

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**Abstract.** This study presents a new nonparametric method for prediction of a future bivariate observation, by combining non-parametric predictive inference (NPI) for the marginals with nonparametric copula. In this paper we specifically use kernel method to take dependence structure into account. NPI is a frequentist statistical framework for inference on a future observation based on past data observations. NPI uses lower and upper probabilities to quantify uncertainty and is based on only few modelling assumptions. While, copula is a well-known statistical concept for modelling dependence of random variables. A copula is a joint distribution function whose marginals are all uniformly distributed and it can be used to model the dependence separately from the marginal distributions. We estimate the copula density using kernel method and investigate the performance of this method via simulations. We discuss the simulation results to show how our method performs for different sample sizes and apply the method to data sets from the literature and briefly outline related challenges and opportunities for future research.