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BOOK OF ABSTRACTS

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Marshall-Olkin introduced a new method of adding a shape parameter to any continuous distribution. In this research, we consider the modified Kumaraswamy distribution as the base distribution and apply it in the MO generator in order to create a new model with three parameters. Cumulative distribution, probability density and hazard functions are derived for the new model. All functions associated with the new model are simple and manageable. Maximum likelihood estimation is used to estimate the parameters, which requires the Fisher information matrix for assessing its asymptotic distribution. Finally, the research includes simulation studies and applications to real data.

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Estimating the number of communities in weighted networks

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The Stochastic Block Model is a commonly used model in real networks that exhibits community structure, that is, the vertices of the network are divided into groups. However, the number of communities related to the underlying model is not specified in real data, so it is necessary to use inferential methods to estimate this number. The objective of this work is to study the method proposed by [1] to estimate the number of communities for binary networks. Moreover, we will adapt this method to estimate the number of communities in weighted networks.

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Toward Local and Valid Uncertainty Estimation in Machine Learning

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Predictive models make mistakes, and thus it is often important to quantify the uncertainty associated with their predictions. Recently, conformal inference emerged as a powerful tool in creating statistically valid prediction regions. However, the application of conformal machinery to prediction methods yields sub-optimal regions that are not adaptive. Researchers have overcome this by designing new conformal scores. Although they are useful in creating prediction bands, these are detached from the original goal of transforming simple point predictions into prediction intervals and use more complicated base models to generate prediction regions such as quantile regression methods and conditional density estimators. In this work, we focus on improving the existing conformal regression split method. We develop a framework capable of generating locally adaptative prediction intervals using decision tree-based feature space partitions. We compare our method to other adaptative approaches, such as the locally weighted conformal split and Mondrian conformal split.

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Population-based change-point detection for the identification of homozygosity islands

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