

## **The Harris-G power series class of distributions with applications**

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### **Abstract**

This study introduces a novel class of distributions (CoD) called the Harris-G power series (H-GPS) CoD. The model is obtained by compounding the Harris-G distribution with the power series distribution (PSD). Some statistical properties including quantile function, linear representation, distribution of order statistics, moments, probability weighted moments and Rényi entropy are developed. Four special cases including the Harris-log-logistic distribution, Harris-log-logistic logarithmic distribution, Harris-Weibull Poisson distribution and the Harris-Weibull logarithmic distribution are presented. Parameter estimation is done using maximum likelihood estimation technique. A simulation study is carried out for the special case of Harris-Weibull Poisson (H-WP) distribution. Finally the Harris-Weibull Poisson is applied to two real datasets to illustrate the usefulness and applicability of the model.

**Keywords:** Harris-G, power series, generalised distribution, maximum likelihood estimation, MLE, moments, order statistics, entropy