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Project management under uncertainty beyond beta: the generalized bicubic distribution

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Abstract Beta distribution has been traditionally employed in PERT methodology and, in general, to model bounded continuous random variables based on expert's judgment. The impossibility of estimating four parameters from the three values given by the expert, when it is supposed the beta distribution as underlying distribution, has been widely debated. This paper presents the Generalized Bicubic distribution as a good alternative to beta distribution since when the variance depends on the mode, the Generalized Bicubic distribution approximates the kurtosis of the gaussian distribution better than the beta. In addition, this distribution presents good properties in PERT methodology in relation to moderation and conservatism criteria. Two empirical applications are shown to confirm the goodness of this new distribution.

Keywords Uncertainty; PERT; Bicubic Distribution; Beta Distribution

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