

**Title: The role and nature of simulation studies in evaluating approaches to cluster analysis**

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Often, benchmarking in clustering and classification is conducted by comparing and contrasting various algorithms and procedures on data sets with known structure via simulation. These comparisons take place at both a broad level (e.g., a full experimental design) and a narrow level (e.g., a couple of generated examples). Regardless of the approach, it is found that the evaluation of the performance of methods is closely linked to the nature of the generation. Results are provided that quantify the "robustness" of various performance critiques based on how stable the assessment of clustering algorithms across generation schemes.

Key Words: Cluster analysis, classification, validation, simulation