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Recent Advances in System Reliability Theory Using Signatures

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Abstract
The purpose of the paper is to show the recent advances in the representations of system reliability functions based on mixtures and signatures. The first representation obtained by Samaniego in 1985 holds only for coherent systems with independent and identically continuously distributed components. Under some symmetry assumptions we show that these representations can be extended to systems with dependent components. They can also be extended to systems with different number of components and to mixed systems, that is, to mixtures of coherent systems. To obtain these new representations, we need to do some changes in the definitions of signature vectors.

Keywords: Coherent systems, signatures, reliability, mixtures, stochastic orders.

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