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A New Reliability Allocation Method Based on Fuzzy Numbers

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Abstract : Reliability allocation is quite important during early design and development stages for a system to apportion its specified reliability goal to subsystems. This paper improves the reliability fuzzy allocation method and gives concrete processes on determining the factor set, the factor weight set, judgment set, and multi-grade fuzzy comprehensive evaluation. To determine the weight of factor set, the modified trapezoidal numbers are proposed to reduce errors caused by subjective factors. To decrease the fuzziness in the fuzzy division, an approximation method based on linear programming is employed. To compute the explicit values of fuzzy numbers, centroid method of defuzzification is considered. An example is provided to illustrate the application of the proposed reliability allocation method based on fuzzy arithmetic.

Keywords : reliability allocation, fuzzy arithmetic, allocation weight, linear programming
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