

MACHINE REPAIR PROBLEM UNDER UNCERTAIN ENVIRONMENT

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Abstract

Machine repair is an important problem frequently encountered in production and manufacturing operations such as semiconductor manufacturing and maintenance operations. Due to uncontrollable factors, parameters in the machine repair problem may be fuzzy. Uncertainty associated with the input parameter are solved using Fuzzy set theory .This paper proposes a integer non linear programming 0 - 1 approach to construct the membership function of the performance measure of the machine repair problem with the machine breakdown rate and the service rate being fuzzy numbers. Using extension principle and α cuts, a pair of mathematical programs is formulated to calculate the lower and upper bounds of the fuzzy performance measures. By enumerating different values of α , the membership function of the system performance measure is constructed.

Keywords : Fuzzy set theory, machine interference system, integer non linear programming, extension principle, α cuts.