

NOISE REDUCTION TECHNIQUE FOR A SIMULATION OPTIMISATION STUDY

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Abstract:

This paper reports on an attempt to apply Genetic Algorithms to the problem of optimising a complex system, through discrete event simulation (Simulation Optimisation), with a view to reducing the noise associated with such a procedure. We are applying this proposed solution approach to our application test bed, a Crossdocking distribution centre, because it provides a good representative of the random and unpredictable behaviour of complex systems i.e. automated machine random failure and the variability of manual order picker skill. It is known that there is noise in the output of discrete event simulation modelling. However, our interest focuses on the effect of noise on the evaluation of the fitness of candidate solutions within the search space, and the development of techniques to handle this noise. The unique quality of our proposed solution approach is we intend to embed a noise reduction technique in our Genetic Algorithm based optimisation procedure, in order for it to be robust enough to handle noise, efficiently estimate suitable fitness function, and produce good quality solutions with minimal computational effort.

Keywords: Simulation Optimisation, Crossdocking, Discrete Event Simulation, Genetic Algorithms, Noise.

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