



ANALYTICAL AND SIMULATION APPROACHES TO ANALYZE FUZZY AND CLASSICAL QUEUES

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Abstract

The purpose of this paper is to combine the ability of fuzzy sets to represent practical situations with the well established queuing formulae. By the use of α -cuts, M/F/I queue has been considered and reduced to a family of M/G/I queues with different α -level sets and solved in closed form with ease. Similarly, for the F/F/I system the α -cut approach has been used to reduce it into a family of F/G/I and G/G/I systems of queues and various aspects have been discussed. It is shown further that this approach can utilize the advantages of both the fuzzy and probability approaches to make the model more realistic and less restrictive. Trapezoidal fuzzy numbers have been used to obtain some analytical and simulation results and some examples have provided for discussion.

Key words : Fuzzy sets, Fuzzy random numbers, α -cuts and Fuzzy queues.