

Simulation of two-way communication retrial queueing systems with unreliable server and impatient customers in the orbit

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Models of two-way communication queueing systems play an important role because it is possible to model real-life scenarios utilized in many fields of life like in [1], [2]. It is a natural phenomenon having impatient customers in such systems resulting in earlier departure due to the long wait for being served ([3], [4]). For this reason, we consider a two-way communication system with an unreliable server where primary customers may leave the system after residing in the orbit for a certain amount of time. The failure of the service unit can occur during its operation or in an idle state, too. One important characteristic of our model is that the server generates requests towards the customers from an infinite source in idle state. These will be the secondary customers and they come into the system if the service unit is available and functional upon their arrivals. Otherwise, they return without entering the system. In case of a server failure, every individual in the finite source may continue generating requests but these will be forwarded immediately towards the orbit. The source, service, retrial, impatience, operation, and repair times are supposed to be independent of each other. In this paper, we carry out a sensitivity analysis on some main performance measures to check the effect of different distributions of failure time.

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