

# A Discrete-time Queueing System With Imperfect Information for the Server

Iván Atencia, José Luis Galán-García, Gabriel Aguilera-Venegas, Pedro Rodríguez-Cielos, Yolanda Padilla-Domínguez, María Ángeles Galán-García  
University of Málaga

iatencia@ctima.uma.es, jlgalan@uma.es, gabri@ctima.uma.es,  
prodriguez@uma.es, ypadilla@ctima.uma.es, magalan@ctima.uma.es

## Abstract

We consider a discrete-time  $Geo/G/1/\infty$  system in which a customer that finishes its first essential service may opt to abandon the system, to receive a second optional service or to place at the head of the queue in order to receive another essential service. We study the Markov chain underlying the considered queueing system and its ergodicity condition. Using a generating function approach the distribution of the number of customers in the queue and in the system as well as their respective means are given.

The busy period of an auxiliary system, that will be useful to study the customers delay is analysed. The distributions of the sojourn time of a customer in the server, the queue and the system are provided. In order to illustrate the effect of the parameters on several performance characteristics some numerical examples are given. Finally, a section of conclusions describing the main research contributions of the paper are presented.

## References

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