

Petri Net Modeling and Simulation of a Call-Taxi System

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Abstract : A call-taxi system is a type of taxi service where a taxi could be requested through a phone call or mobile app. A schematic functioning of a call-taxi system is modeled using Petri net, which provides the necessary conditions for a taxi to be assigned by a dispatcher to pick a customer as well as the conditions for the taxi to be released by the customer. A Petri net is a graphical modeling tool used to understand sequences, concurrences, and confluences of activities in the working of discrete event systems. It uses tokens on a directed bipartite multi-graph to simulate the activities of a system. The Petri net model is translated into a simulation model and a call-taxi system is simulated. The simulation model helps in evaluating the operation of a call-taxi system based on the fleet size as well as the operating policies for call-taxi assignment and empty call-taxi repositioning. The developed Petri net based simulation model can be used to decide the fleet size as well as the call-taxi assignment policies for a call-taxi system.

Keywords : call-taxi, discrete event system, petri net, simulation modeling

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