

Dynamic optimisation of elevators using biometric identification systems

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Abstract

The research focused on developing a real-time monitoring algorithm for elevators in residential towers. The study employed methods, models, and software tools to build intelligent real-time decision-making systems. A model for the elevator setting process was implemented through a Markov decision-making process. The theory of mass service was applied to describe the model of elevator operations. Passenger waiting time patterns at some levels of the towers have been established. A mathematical model for managing passenger flows through the elevators of a high-rise building in real-time using facial recognition identification technology has been developed. In test mode, a face-recognition elevator control system has been installed in four elevators. The scientific value of the work resides in the multi-purpose nature of the mathematical optimisation model, its simplicity and accuracy. The proposed model allows optimising numerous elevator systems with a constantly evolving control algorithm tailored to the customer's preferences.

Keywords: *lifting facility, Markov process, mathematical model, traffic fluctuations, biometric data*