Mathematical Model of Average waiting time for an Elevator Based on Stochastic Process

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Abstract

In this research, we formulate a mathematical model to obtain elevator operating index, especially average waiting time. The users generated on each floor of the building installed elevator will occur with the Poisson distribution and the service time by the elevator will be the Exponential distribution. Given these, we create a mathematical model that calculates average wait time and elevator operating index based on queue and stochastic process. Then, we compare the operation index by computer simulation with the value obtained by the model. It will be given these, we create a mathematical model that calculates average wait time and elevator operating index based on queue and stochastic process. Then, we compare the operation index by computer simulation with the value obtained by the model.

Keywords
elevator performance, stochastic model, critical probability

Biographies

Yuki Satoh is currently a student of the advanced course in Production Systems Engineering, Salesian Polytechnic Japan. His research interests include discrete mathematics, mathematical model and operations research.

Yoichi Shimakawa is a Professor and Director of the Department of Computer Science and Technology, Salesian Polytechnic Japan. He received his B.S. and M.Sc. degrees from Chuo University in 1990 and 1996. In 1998, he joined the staff as a research assistant on the research project "Integrated Geographic Information Systems" at Chuo University. He received his D.E. degree from Chuo University. He received paper awards from the Operations Research Society of Japan (ORSJ) in 2002. He is a member of ORSJ and the Geographic Information Systems Association of Japan.