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## Evaluation and Optimization of Automatic Drug Dispensing / Filling System

**H. Wang and S. W. Yoon**

Department of Systems Science and Industrial Engineering  
State University of New York at Binghamton  
Binghamton, New York 13902 USA

Corresponding author's Email: [yoons@binghamton.edu](mailto:yoons@binghamton.edu)

**Abstract:** This paper presents an analysis of the system configuration to optimize its dispensing / filling time in a robotic drug dispensing system while maintaining the system's high accuracy and speed. A discrete simulation model has been developed to study a series of these automated dispensing / filling systems, and it has been identified that the filling process is a major bottleneck. To eliminate this bottleneck, different scheduling rules, such as highest priority first serve (HPFS), first come first serve (FCFS), shortest process time (SPT), and shortest total process time (STPT) methods, have been studied. Then, several system operation strategies are proposed to optimize the process such as using multiple machine arms and applying queue entry policy combinations. The results shows that optimal solutions can be achieved under different performance criteria, such as maximum outcomes, maximum machine utilization, and balanced load distribution.

*Keywords:* Drug Filling System, Queuing Theory, Discrete Event Simulation