1. A novel GA-based feature selection approach for patient arrival prediction in two different areas

Mr Shancheng JIANG
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2. Simulation Optimization for Medical Staff Configuration at Emergency Department in Hong Kong

Ms Hainan GUO
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City University of Hong Kong

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Abstract (Seminar 1)

Among a health care system, the emergency department(ED)-which is called outpatient department in China-is facing increasing stress year after year. Prediction of patient arrivals is a premise for rostering and scheduling. Feature selection(FS) process are directly related with the quality of the forecast model. Hence, we designed a modified GA based FS approach, to acquire an optimal input feature subset for prediction. Then, the underlying relationship between patient arrival patterns and different categories of input co-variables are explored. Finally, our methodology is tested via two ED systems in different two areas. The results further validate the universality of our methodology.

About the Speaker (Seminar 1)

Jiang Shancheng received the Bachelor Degree of Engineering in Automation from Northeastern University, P.R.China, in 2012 and then received the Master Degree of Engineering in Systems Engineering from Northeastern University, P.R.China, in 2014.
He is currently a Ph.D student in Department of Systems Engineering and Engineering Management at the City University of Hong Kong, Hong Kong, China, supervised by Dr. K.S. CHIN. The research topic of him is utilizing data mining tools to solve the decision making problems in health care system.

Abstract (Seminar 2)

Medical staff configuration is a critical problem in the management of emergency department (ED) in Hong Kong (HK). Given the service requirements by HK government, it is imperative for the hospital managers to develop medical staff configuration in a cost-and-time-effective way. In this paper, the medical staff configuration problem in ED is modeled as minimizing the total labor cost while satisfying the service quality requirements. To solve this issue, we propose a highly efficient search method, called random boundary generation with feasibility detection (RBG-FD). The random boundary generation (RBG) is applied to efficiently identify good-quality solutions based on the objective value. The feasibility detection (FD) procedure is used to retain the probability of correct feasibility detection of each sampled solution at the desired level, which intrinsically allocates a reasonable number of simulation replications. By using these two techniques, the efficiency of finding the optimal staff configuration can be significantly improved. A case study is performed in a public hospital in HK. By testing different patient arrival rates and service constraints, the numerical results indicate significantly higher practicability and efficiency of the proposed method.

About the Speaker (Seminar 2)

Hainan Guo received the B.S. degree in Automation from the Northeastern University, Shenyang, China, in 2011, and the M.S. degree in Systems Engineering from the Northeastern University, Shenyang, China, in 2013. She is currently pursuing the Ph.D. degree in the Department of Systems Engineering and Engineering Management, City University of Hong Kong, Hong Kong, supervised by Prof. Kwok-Leung Tsui. Her research interests include simulation optimization, healthcare management, and scheduling problem.

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All are Welcome!