

An intelligent operating rooms scheduling under mass casualty events

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Mass casualty events generate large numbers of acutely ill or injured people who require immediate medical health care. The Operating Room (OR) is the key department that provides surgeries to victims. Efficient management and allocation of scarce medical resources in ORs can improve outcomes for victims of mass casualty events, operating rooms scheduling deals with determining surgeries sequence and allocating medical resources. Under mass casualty event, operating rooms scheduling calls for a dynamic scheduling with a wide variety of patients, surgeries and unforeseen emergencies. Dynamic scheduling does not create or update schedules; instead, the scheduling mechanism is based on decentralized dispatching. The research interest here focuses on an agent-based approach to scheduling of dynamic operating rooms. The operating rooms can be built up by heterogeneous intelligent agents involving patients, surgeries, medical resources, staffs like doctors, nurses and anesthetists with diverse goals, constraints and behaviors. These agents have emergent behavior in response to disturbances in the environment and generate flexible scheduling in a dynamically adaptive way. In order for a multi-agent-system to solve such distributed operating rooms scheduling problem coherently, agents must communicate amongst themselves and coordinate their activities to make decisions. Ant colony intelligence is proposed to be combined with local agent coordination so as to make autonomous agents adaptive to changing circumstances and to give rise to efficient global performance under mass casualty events..

Biography

Wei Xiang has obtained her PhD from Nanyang Technological University in Singapore. She is currently the Vice-Dean of Department of Industry Engineering in Ningbo University, China. Her research interests cover manufacturing system engineering, operational research, planning and scheduling in healthcare management and swarm intelligence application in healthcare. She has published around 30 papers in various journals..

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