Research project and supervisor team

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Short introduction & description of research project	Surgery is one of the most important treatment methods in hospital operations, involving the most expensive equipment and extensive human resources. Efficient utilization of surgical medical resources is key to cost-saving, improving work efficiency, and providing satisfactory services to patients. Under the existing system, operating room scheduling often relies on manual handling, which is susceptible to individual judgment and preferences. This leads to a lack of flexibility in dealing with emergencies, resulting in uneven resource allocation, low efficiency, inability to coordinate across departments in a timely manner, and inefficient resource use, causing long wait times for patients. Effective operating room scheduling can optimize resource use, cut costs, enhance surgical efficiency, boost patient satisfaction, and increase revenue. Hence, it is one of the key focus areas for hospital management. Overall, operating room scheduling is a challenging multifaceted and dynamic problem. It requires balancing the urgent needs of emergency cases, the unpredictability of surgery durations, the availability of specialized equipment, and the coordination of multiple departments and staff members. The complexity of this task is further heightened by the need to maximize operating room utilization while minimizing patient wait times and ensuring the delivery of high-quality care. Effective operating room scheduling, therefore, requires sophisticated strategies that can adapt to changes and accommodate the various uncertainties inherent in the healthcare environment. To effectively and efficiently deal with various practical constraints and system uncertainties, this project will propose novel data-driven operating room scheduling methods by combining machine learning with mathematical programing and optimization techniques. The project will conduct real-data based experiments and is expected to be in collaboration with Ningbo First Hospital for validating the proposed methods and generating real impact.
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