The healthcare system is always defined as a complex system. At its core, it is a system composed of people and processes and requires performance of different tasks and duties. This complexity means that the healthcare system has many stakeholders with different interests, resulting in the emergence of many problems such as increasing healthcare costs, limited resources and low utilization, limited facilities and workforce, and poor quality of services.

The use of simulation techniques to aid in solving healthcare problems is not new, but it has increased in recent years. This application faces many challenges, including a lack of real data, complicated healthcare decision-making processes, low stakeholder involvement, and the working environment in the healthcare field.

The objective of this research is to study the utilization of case-based reasoning in simulation modeling in the healthcare sector. This utilization would increase the involvement of stakeholders in the analysis process of the simulation modeling. This involvement would help in reducing the time needed to build the simulation model and facilitate the implementation of results and recommendations. The use of case-based reasoning will minimize the required efforts by automating the process of finding solutions. This automation uses the knowledge in the previously solved problems to develop new solutions. Thus, people could utilize the simulation modeling with little knowledge about simulation and the working environment in the healthcare field.

In this study, a number of simulation cases from the healthcare field have been collected to develop the case-base. After that, an indexing system was created to store these cases in the case-base. This system defined a set of attributes for each simulation case. After that, two retrieval approaches were used as retrieval engines. These approaches are K nearest neighbors and induction tree. The validation procedure started by selecting a case study from the healthcare literature and implementing the proposed method in this study. Finally, healthcare experts were consulted to validate the results of this study.

Major: Industrial Engineering

Educational Career:
Bachelor's of Industrial Engineering, BS, 2005, King Fahd University of Petroleum and Minerals
Master's of Industrial Engineering, MS, 2008, King Fahd University of Petroleum and Minerals
Master's of Industrial Engineering, MS, 2011, University of Florida

Committee in Charge:
Luis Rabelo, Chair, Industrial Engineering and Management Systems
Ahmad Elshennawy, Co-Chair, Industrial Engineering and Management Systems
Gene Lee, Industrial Engineering and Management Systems
Ahmad Rahal, University of Arkansas - Fort Smith

Approved for distribution by Luis Rabelo, Committee Chair, on October 18, 2016.

The public is welcome to attend.