

Concepts, Foundations, and Model-Based Techniques Applied to Computer Assisted Surgical Training



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ABSTRACT

The presentation will discuss concepts, foundations, and modelling techniques used to design and implement computer-based tools for surgical training.

Laparoscopic surgery is a surgical technology that can minimize recovery time and postoperative pain. However, with this procedure surgeons lose many of the tactile and visual cues that they rely upon in conventional surgery. Current research and commercial products focus on virtual simulation of procedures, generation of haptic feedback for training, and automated control of the laparoscope in the operating room (OR). This talk will provide an overview of the concept, will discuss some of the existing systems, their advantages and shortcomings. Then, a design concept for a surgical training and assessment system that provides sensing and reasoning capabilities for laparoscopic education will be presented. The system implements sensors and offers real-time feedback that can enhance sensory input for trainees and surgeons. A training device prototype has been developed. Preliminary results from a study conducted with novice and experienced subjects will be presented. Current research work focus on developing the technology as a surgical assistant system for use in the operating room.

SHORT BIOGRAPHY

Jerzy Rozenblit is Raymond J. Oglethorpe Endowed Professor and Head of the Electrical and Computer Engineering Department at The University of Arizona. He also holds a joint appointment as Professor of Surgery in the College of Medicine. During his tenure, he has established the Model-Based Design Laboratory with major projects in design and analysis of complex, computer-based systems, software engineering, embedded systems, and symbolic visualization. He had served as a research scientist and visiting professor at Siemens AG and Infineon AG Central Research and Development Laboratories in Munich, Technical University of Munich, University of Perugia, and Fulbright Senior Scholar in Austria and Poland. Currently, jointly with the Arizona Surgical Technology and Education Center, he is developing virtually assisted surgical training methods and systems, and computer-guided techniques for minimally invasive surgery. In 2009, he was named University Distinguished Professor.