An Overview of the State of the Art Technologies in Robot Surgery.

Syed M. Ali, Sachin Daluja
Graduate Students, Electrical and Computer Engineering Department
Smart Sensors and Integrated Microsystems Laboratory (SSIM)
Computer Assisted Robot Enhanced Systems Group (CARES)
Wayne State University.

Wednesday 10/17/07 1:30-3:00 Eng 1200 (Hall of Fame)

Abstract: Robot surgery provides several benefits over traditional surgical techniques. Some of these benefits are better ergonomics for surgeons, increased dexterity, tremor filtration and motion scaling. This talk will be an introduction to this field of study with the presentation of a few examples of recent advancements. Minimally Invasive surgery (MIS) allows surgeons to operate through small incisions compared to larger cuts in traditional surgeries. A Flexible or rigid endoscope inserted through a trocar into the patient’s body provides video feedback to the surgeon and the surgery is performed using rigid rod-like structured laparoscopic instruments. Telesurgery has been made possible with surgical robots and operations have been performed remotely over distances of more than 4000 miles. Our engineering team at SSIM-CARES is collaborating with surgeons at the Detroit Medical Center and Children’s Hospital and working on finding solutions to some of the problems in medical robotics. One of the systems that will be presented is an Autonomous Robot Assisted Laparoscopic Camera Positioning System. This system can track a user’s eye and move the laparoscopic camera to the desired region of interest. In addition, a tracking system that can track and replay surgical movements performed by the surgeon controlling a medical robot will be presented.

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