

FIELD OPERATION OF A SURGICAL ROBOT VIA WIRELESS RADIO LINK

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Robotic assisted surgery became quite popular during 1990 because of the two-handed teleoperated surgery unit for DARPA. Computer Motion Inc developed “ZEUS” and Intuitive Surgical Inc (ISI) developed “DA VIN CI” robot in 2003 which are controlled by joystick. Both of the systems are teleoperators but neither had the capability to separate the surgeon and the patient by more than a few feet.

In this project, instead of joysticks angle sensors are used to detect the hand motion of the surgeon with higher degree of freedom. Existing topologies like geosynchronous satellites can provide wireless communication for use in mobile telesurgery, long latency as the result of signal transmission distance precludes robust use of satellite communication in telesurgery. Thus the telesurgery can be performed at very long distances.

This project is a prototype in which telesurgery is shown using simple RF transmission instead of using internet and satellite. The hand movements of the surgeon are detected using angle sensors and their output is fed to a microcontroller. Then they are transmitted using RF transmitter. The transmitted signals are used to sync the robot hands with the hand movements of the surgeon using stepper motors. The surgeon operates on seeing the video which is transmitted from wireless camera. Thus the telesurgery can be performed using the surgical robot.