

A NOVEL SURGICAL GUIDANCE SYSTEM UTILIZING HYBRID FLUORO-STEREOSCOPE NAVIGATION FOR AN ORTHOPEDIC SURGERY

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This paper describes a new approach to aid surgeons in recovering the position and orientation of an intramedullary nail after being inserted into a patient's femur canal. This approach utilizes both fluoroscopic system and optical stereoscope with a computer-integrated method. The method includes using a 3-D tracking system with markers, and mapping coordinate frames and axes received from fluoro-images into real-time optical-images on a computer system. A mathematical model and an algorithm to generate a guiding path for the surgery guidance system are developed and described. This work is the first phase in our undergoing development on a robot-assisted surgery system in orthopedic operations.

Key Words: Computer Integrated Surgery, Fluoro-Navigation, Biomedical Engineering.