Abstract

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A Handheld Robot for Orthopedic Surgery – ITD.

This paper describes the specification: development of the handheld medical robot ITD for orthopedic surgery. The robot compensates unintended movements of the surgeon: the patient: thus stabilizes the relative position of a drilling tool to the bone. To do so a highly dynamic but lightweight robot is held in the surgeon’s hand: a special occlusion-robust tracking system provides fast: accurate position information. Additionally an inertial tracking system is implemented in the robot. To prove the system’s functionality, experiments with polystyrene foam have been carried out with the first prototype based on the hexapod kinematics. A second prototype provides higher dynamics, lower outlines: weight: is based on the Hexaglide kinematics. Both robots are still too large for routine surgical use but prove good potential for future developments.