1-D Surface Tracking and Motion Compensation Hand-held Microsurgical Tool System Based on Dynamic Common-Path Optical Coherence Tomography Sensor

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Technology description

Value Proposition:
A CP-OCT distance sensing probe coupled with a piezoelectric micro linear motor is used on 1-D microsurgical tool tips for tactical feedback. A predictor algorithm uses the OCT signal to ensure precise and efficient targeting in this system in order to mitigate surgical error.
Technical Details:
Johns Hopkins University inventors have developed a highly effective, real-time 1-D surface tracking and motion compensation system based on dynamic common-path optical coherence tomography (CP-OCT) distance-sensor. The system uses a single fiber as a CP-OCT distance-sensing probe and a piezoelectric micro linear motor for the 1-D actuation of tips of microsurgical tools. The distance between the tool tips and the surgical target surface is determined from the OCT signal by automatic edge-searching and predictor algorithms which eliminates the false surface and allows high speed real-time tracking and compensation. The microsurgical tool system is capable of surface tracking and motion compensation with better than 5 micrometer accuracy for motions up to 5 Hertz.

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