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Seeing Beyond: Real-time Ultrasound Image Integration in Augmented Reality Based Telementoring

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ABSTRACT

Ultrasound imaging, when aptly integrated with augmented reality based medical telementoring, may be beneficial as an assistive tool in a range of trauma procedures including removal of foreign objects from blast injuries and central or peripheral venous access. Expected benefits include reduced procedure completion time, higher efficiency, and higher incision accuracy. This paper describes the implementation strategy selected for the integration of real time ultrasound imaging in the trainee view of a telementoring system. The proposed strategy augments the view of the trainee surgeon by displaying the ultrasound image directly below and parallel to the ultrasound transducer. The developed system features a fiducial marker based tracking approach employing a triplanar geometric fixture. An experiment was designed to demonstrate the system function and validate its performance.

KEYWORDS

Ultrasound Imaging, Telementoring, Augmented Reality, Fiducial Tracking