Augmented Reality for Tele-mentoring in Trauma: Thoracostomy Tube Insertion Simulator

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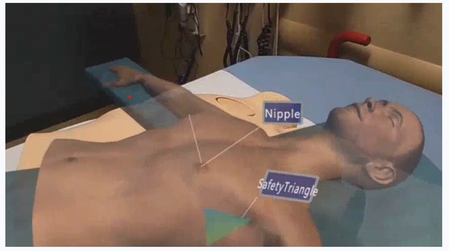
Introduction

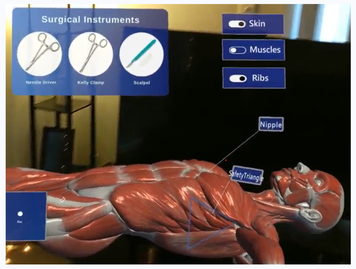
- Previous approaches in AR/VR lack interactivity, while this simulation aims for intuitive & interactive learning experience
- AR offers real-time learning and collaboration which has proven to enhance surgical trainees' performance especially with limited hands-on training experience
- The simulation aims to provide real-time feedback & guidance during critical bedside procedures, improving training quality & accessibility by using AR to overlay realistic 3D anatomical models & provide simultaneous tele mentoring

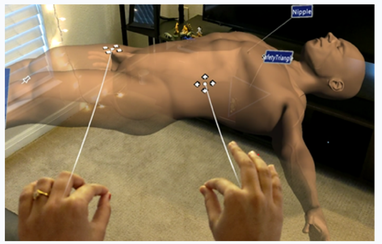
Approach

- The simulation was developed in Unity 3D using Mixed Reality Toolkit - MRTK
- 3D anatomical models are superimposed onto a physical manikin
- Intuitive interaction such as transitioning between anatomical layers, grabbing and interacting with the digital manikin using hand gestures
- Remote mentoring using Microsoft Remote Assist

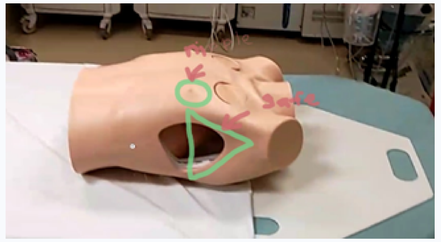












Results

- A preliminary simulation has been developed, allowing trainees to position the digital manikin on the physical one and interact with the different layers using intuitive hand gestures
- Microsoft Remote Assist has been successfully used as a tele-mentoring platform, allowing mentors to annotate the trainees' visual display, with improved accuracy and effectiveness for thoracostomy tube placement

Conclusion

- The project successfully demonstrates the potential of AR integrated with tele-mentoring for enhanced surgical training and collaboration
- Next steps: integrate real-time annotation and digital object placement through tele-mentoring and it assess completion time, competency and performance using automated assessments.

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