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Enhanced 3D Visualization: Augmenting Musculoskeletal Ultrasound Training

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KEY LEARNING OBJECTIVES

Specialist medical education is changing to reflect current trainees' needs. Detailed anatomy is becoming a post-graduate subject and increasingly doctors must learn anatomy as part of their early specialist training [1]. Interpreting complex 3D subject matter often requires a strong grasp of the 3D anatomy to which it relates. This is compounded when procedural techniques and specialist anatomy are effectively taught simultaneously. However, it has been shown that anatomy learning can be augmented by the use of high-resolution 3D models [2]. To this end, we developed a resource facilitating training in musculoskeletal ultrasound imaging of the foot and ankle. This application had the specific objective of integrating the teaching of specialist 3D anatomy with clinical procedure and image interpretation.

DESCRIPTION

We employed a visualization methodology that allowed real-time interlinking between a low latency rotational 3D anatomical model, visual descriptors of ultrasound technique (positioning, movement, field) and clinical ultrasound images. Notably, the system was designed to synchronously augment current clinical training or to be self-led and asynchronous. It was designed to convey the anatomy to a multi-disciplinary audience. The approach capitalises on current educational theory and enhances the current approaches by utilising advanced visualisation with an emphasis on practical and intuitive interfaces [3].

CONCLUSION

This paper explores the empirical evidence regarding 3D visualisation and the enhancement of spatial learning and describes the integration of robust anatomical modelling techniques, intuitive human-computer interface and current educational theory. [4].

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