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Three-Dimensional Computer Visualization of Forensic Pathology Data

American Journal of Forensic Medicine & Pathology:
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Case Report

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Abstract

Despite a decade of use in US courtrooms, it is only recently that forensic computer animations have become an increasingly important form of communication in legal spheres within the United Kingdom. Aims Research at the University of Nottingham has been influential in the critical investigation of forensic computer graphics reconstruction methodologies and techniques and in raising the profile of this novel form of data visualization within the United Kingdom. The case study presented demonstrates research undertaken by Aims Research and the Department of Forensic Pathology at the University of Sheffield, which aims to apply, evaluate, and develop novel 3-dimensional computer graphics (CG) visualization and virtual reality (VR) techniques in the presentation and investigation of forensic information concerning the human body. The inclusion of such visualizations within other CG or VR environments may ultimately provide the potential for alternative exploratory directions, processes, and results within forensic pathology investigations.

This paper begins to explore novel techniques of 3-dimensional 3D computer graphics (CG) visualization within the field of forensic pathology, assessing the plausibility of presenting complex medical evidence and expert opinion in a visual form to a lay audience. Graphical representations of the human form, upon which specific anthropological variables, injuries, and other forensic data can be demonstrated, provide a more immediate, accessible, and understandable medium for the explanation of theories and case documentation than purely verbal communication. The potential advantages of such visualizations in legal spheres have been highlighted by findings that jurors are often confused, bored, frustrated, and/or overwhelmed by technical or complex issues¹ and that the average attention span of a juror is approximately 7 minutes.² The first section of this paper will introduce current issues in forensic CG visualizations. The remainder of the paper presents a case study visualization of forensic pathology information relating to a suicidal stabbing, with particular emphasis placed upon the comparison of 2 knives found at the scene to documented wounds.