

Tactile-Visual Wound Simulation Unit for Realistic Hands-On Training

Published date: Jan. 18, 2019

Technology description

Multi-Sensory, Interactive Training Unit Lets Combat Medics See, Feel and Treat Lifelike, 3D Wounds

UCF researchers have invented an innovative, multi-sensory, interactive training system that realistically mimics wounds and provides constant, dynamic feedback to medical trainees as they treat the wounds. Almost like a video game in real-life, the Tactile-Visual Wound (TVW) Simulation Unit portrays the look, feel, and even the smell of different types of human wounds (such as a puncture, stab, slice or tear). It also tracks and analyzes a trainee's treatment responses and provides corrective instructions.

Technical Details

The TVW invention is a multi-sensory wound simulation unit. By combining several technologies, the invention provides an immersive experience for trainees. A TVW unit can include augmented reality software and a headset; sensors; actuators and markers integrated into a medical manikin; and a computer processor. An alternative configuration uses interactive moulage components affixed to a real person instead of a manikin. When activated, the unit's AR system continuously tracks the TVW, estimates the deformation of the wound over time, and monitors its response to treatment. For example, a trainee might see (via the AR glasses or headset) a projection that shows blood flowing out of the manikin's wound and vital signs "dropping." When the trainee applies pressure to the wound, sensors detect the action and wirelessly relay the data to the AR system. In response, the AR system renders (via computer graphics) an appropriate dynamic view of the blood loss slowing, and the physiological simulation reflects stabilized vitals. Real-time depth or other models of the trainee's hands, medical devices, and so on, can also affect the simulated visuals that the AR rendering system generates.

Application area

Trauma/critical care training for medical professionals (EMT rescue squads, paramedics, combat medics)

Advantages

Simulates all aspects of wound behavior (sight, sound, touch and smell)

Provides continual visual, physical and audio feedback regarding treatment, skills and techniques

Enables administrators to change simulation conditions dynamically in real time

Institution

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