WORKFORCE DEVELOPMENT IN MODELING, SIMULATION AND VISUALIZATION

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Engineering & Computer Simulations Inc.
AN INTERCONNECTED SET OF SOLUTIONS TO MEET EMPLOYMENT NEEDS. IT SERVES TO ENABLE INDIVIDUALS TO ACQUIRE KNOWLEDGE, SKILLS, AND ATTITUDES FOR IMPROVED WORK PERFORMANCE
A New Generation of Learners

That Are:
• Visual
• Impatient
• Digital
• Confident

Requires:
• Creative teaching strategies
• Collaborative learning exercises
• Relevance to job
Emerging Media & Technologies: Augmented and Virtual Reality

Immersive Content
- Ability to import, port, or directly utilize content from existing assets, games, or simulations
- Ideal for spatial and contextual learning applications
- Integration with haptics & natural user interfaces

Applications
- Just-In-Time Training / Mission Rehearsal
- Capstone Exercises for existing curriculum
- Supplement Live and Virtual Instruction
- Integration of COTS AR/VR technologies with custom software applications

Benefits
- Intuitive interfaces easier to adopt than games
- Improve cost & time efficiencies for live training
- Safe environment to make mistakes
- Collaborative environments for training facilitation and operational communication
What We’ve Provided to Others

Customized Training Solutions

- **Game-Based Training** - Simulations, Multiplayer Virtual Worlds, and Immersive Learning Environments
- **Performance Assessment** – Intelligent Tutoring, Competency Management, and Instructor Support tools
- **Artificial Intelligence** – Adaptive Learning, and data acquisition
- **Modeling & Simulation** - Live, Virtual, Constructive simulation, sensor integration, UI/UX
- **Hardware Integration** - Natural User Interfaces, motion/gesture tracking, head mounted displays, AR/VR/MR, and integration with other peripherals
Medical Applications

- VA Virtual Medical Center
- Clinical Skills
- Crash Cart
- Goals of Care
- Tele-ICU
- Choosing Wisely
- Emergency Management Staff Trainer
- Pediatric Tracheostomy Home Care App
- Patient Centered Care Hospital Simulation
- Interosseous Vascular Infusion Training Game
- TC3 Sim Combat Medic
Issue: Military required a Healthcare Specialist Course to train battlefield medical personnel on proper protocols for injured soldiers.

Approach: ECS worked with experienced medical field personnel and existing classroom modules on International Trauma Life Support (ITLS), Advance Trauma Life Support (ATLS), Pre-Hospital Trauma Life Support (PHTLS) curriculum to design a “first person thinker” serious game.

Results: Developed a multi-service, multi-player training application with scenario editing tools to create new training. Allows for automated assessment of individual and team performance.
**Goals of Care Conversations**

**Issue:** Designed to help physicians become more skilled at eliciting a patient’s general understanding of their condition as well as their concerns, values and goals of care.

**Approach:** Working with SMEs from the VA, ECS designed and implemented a dialog system that was able to offer different conversational options that the physician could choose from to guide the discussion. A virtual palliative care mentor was incorporated to provide the physician with positive feedback and suggestions for improvement if necessary.

**Results:** Learner interacts with Realistic Virtual Patients in a Medical Office Setting, After Action Review system for Nuanced Reflection on Learner’s Decisions, Reflection on Decisions Based on a Formal System of Guidelines in the VA Curriculum
**Clinical Skills Mobile App**

**Issue:** Intended to help combat medics and other military physicians transition from deployed medicine practice for returning to the clinical setting of garrison and stateside facilities.

**Approach:** Clinical Skills Mobile App uses a variety of conversation-based scenarios in a deep learning environment, which prompts learners to use specific approaches while conducting patient interviews. The mobile app includes essential environmental cues, such as patient feedback, as well as instructional feedback. The user is evaluated at each step of the clinical exam and cannot progress until the correct action is performed.

**Results:** A usability test was performed with 30 Army medic students at Fort Sam Houston who had recently finished their clinical skills training. Of the 30 students, 78% of the students provided positive feedback, with a majority of the students saying that the app would have had a positive impact on their training if it was available during their clinical skills training courses.
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