APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED

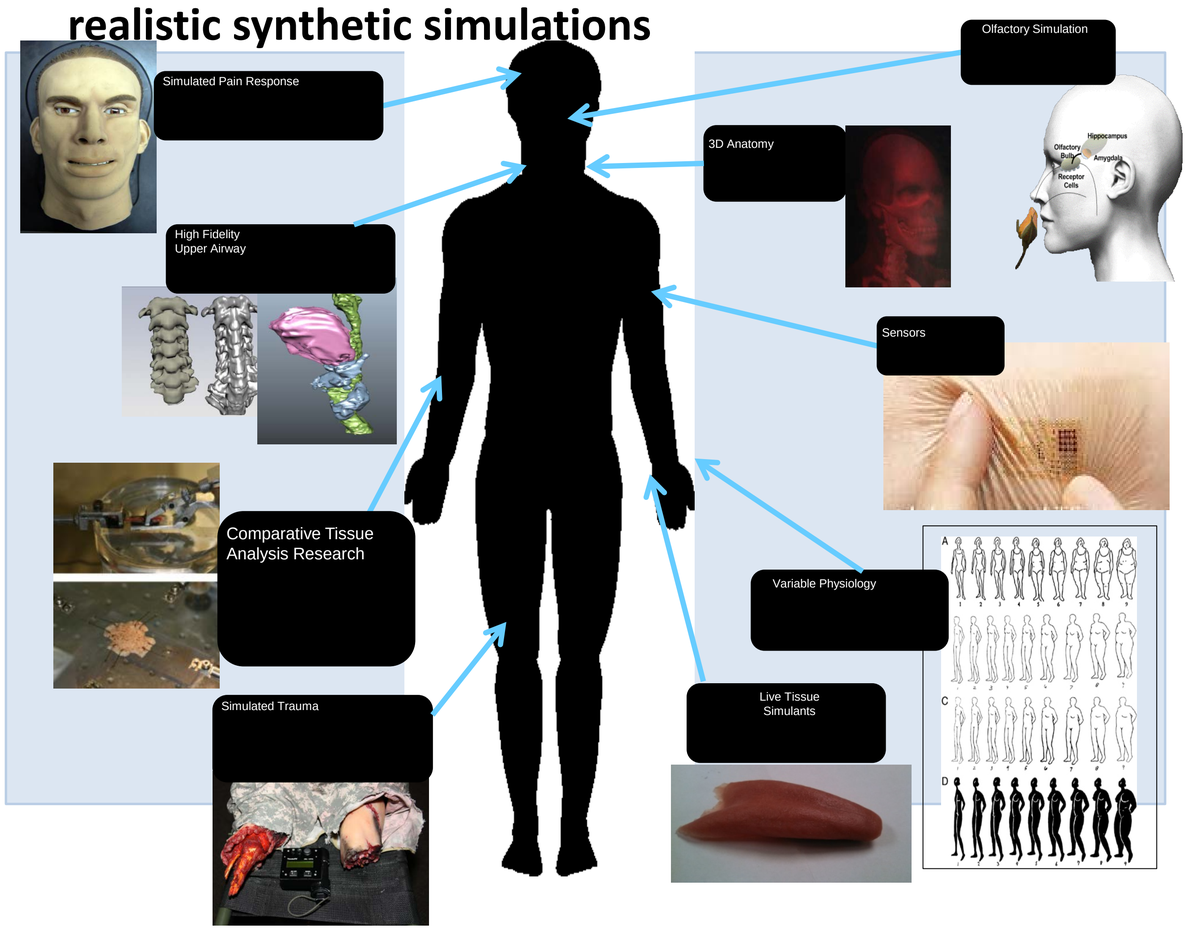
Medical Technologies

S&T Campaign: Human Sciences
Human Capability Enhancement

Mr. Matthew Hackett, (407) 384-5349
mtthew.g.hackett.civ@mail.mil

Research Objective

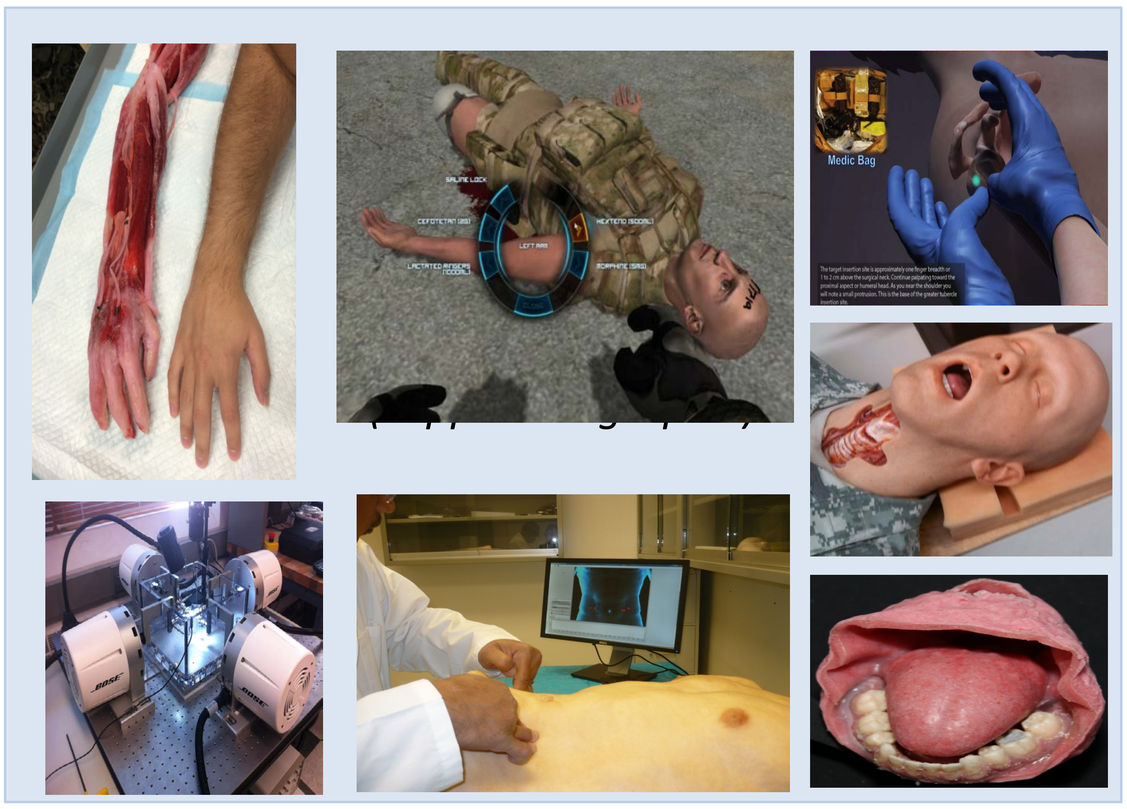
- Improve efficiency and effectiveness of medical training through application of simulations
- Research replicates human body sub-systems with realistic synthetic simulations



ARL Medical Technology Vision 2025 and Beyond

Challenges – Today and Tomorrow

- Simulation of severe trauma through research in olfactory cues, increased realism, simulated motion, and feeling (e.g., physical / psychological, pain, fear)
- Simulation of live tissue replacement technologies to improve tissue behavior, sensors, and human materials
- Application of 3-D visualization, virtuality, and haptics
- Research in serious games, mixed reality, and live training for medical education



Caption depicts research into treating battlefield wounds

ARL Facilities and Capabilities Available to Support Collaborative Research

- ARL Human Research and Engineering Directorate, SFC Paul Ray Smith Medical Simulation Laboratory, Orlando, Florida
- State-of-the-art simulation technologies - virtual reality, 3-D medical holograms, and "live" mannequins
- Experts in simulation engineering and human factors
- Early findings - successful prototyping / replication of medical mannequins, battlefield mannequins, olfactory, upper airway systems, malodors, training efficacy, Multiple Amputation Torso Trainer (MATT), and sensors that train combat medics, physicians, health clinicians, and chaplains
- Experience collaborating with industry, academia, and other governmental agencies, including a series of successful research transitions to full fielding
- Experience in medical care across the entire continuum of care

Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration

- Expertise in mechanical, optical, thermal, and electrical characterization of tissue and materials science capabilities to create synthetic materials mimics those characteristics
- Expertise in sensor technologies that include tracking, touch, pierce, incision, pressure, duration, and direction
- Expertise in malodor effects and PTSD
- Expertise in pain and feeling to include treatments, affective impacts, and cues
- Expertise in 3-D visualization including holography, LiDAR, and autostereoscopic displays
- Expertise in platform-agnostic modular mannequins and low-cost simulations
- Expertise in medical team training and assessment
- Lab facilities supporting above expertise

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED