

**BOARD OF REGENTS
STATE OF IOWA**

**AGENDA ITEM 17
SEPTEMBER 17-18, 2008**

Contact: Andy Baumert

HIGHLIGHTED TECHNOLOGY TRANSFER PRESENTATION

The University of Iowa will highlight the research of Dr. Karim Abdel-Malek, professor in the College of Engineering and Director of the Center for Computer Aided Design. Abdel-Malek is an international expert in human simulation, is the creator of SANTOS, a comprehensive environment for simulating biomechanics, and is the founder and director of the Virtual Soldier Research Program.

SANTOS/Virtual Soldier Research Program

Karim Abdel-Malek, PhD

Director and Professor, Center for Computer Aided Design

- Who is Santos™
- Research at the Virtual Soldier Research Program
- Commercialization process and Battelle Platform



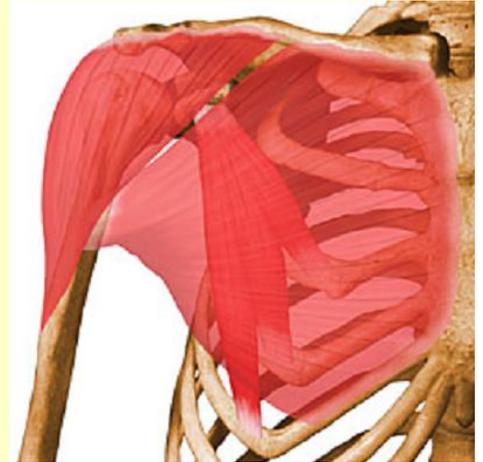
- ✓ A Virtual Soldier
- ✓ Intelligent!
- ✓ Biomechanically accurate
- ✓ Predicts behavior
- ✓ Physics-based



Virtual Soldier Research

Biomechanical Modeling

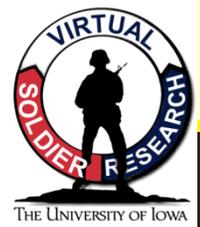
- ✓ Realistic Model
- ✓ Variable anthropometry (size, population)
- ✓ Fatigue model
- ✓ Human performance measures
- ✓ Effort, discomfort, Energy
- ✓ Stress, vision, physiology



Leveraging Iowa Battelle Platform Funding



VSR established (2004) — \$16.2M external funding 35 new positions + recruiting 12 additional — Today (2008)



Virtual Soldier Research

Example Program

US Army Body Armor Simulator (BAS)

- System helps design armor
- System simulates soldier
- Task performance
- Evaluates armor configurations
- Tradeoff analyses

Advanced display
Night vision, 360° field of view, and other imaging technology would project video data on a visor display.

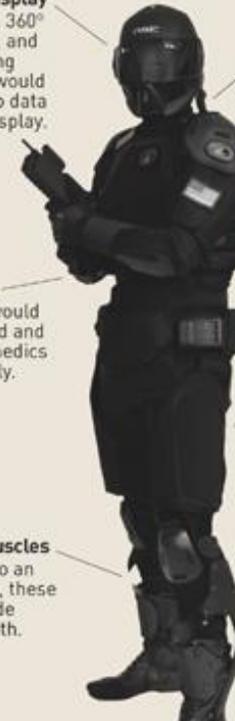
Breathing air
Respiratory protection and climate control would be built into the suit.

Chem and bio protection
Smart fibers would fend off chemical and biological agents, self-decontaminate, and become waterproof.

Biosensors
Vital signs would be measured and relayed to medics automatically.

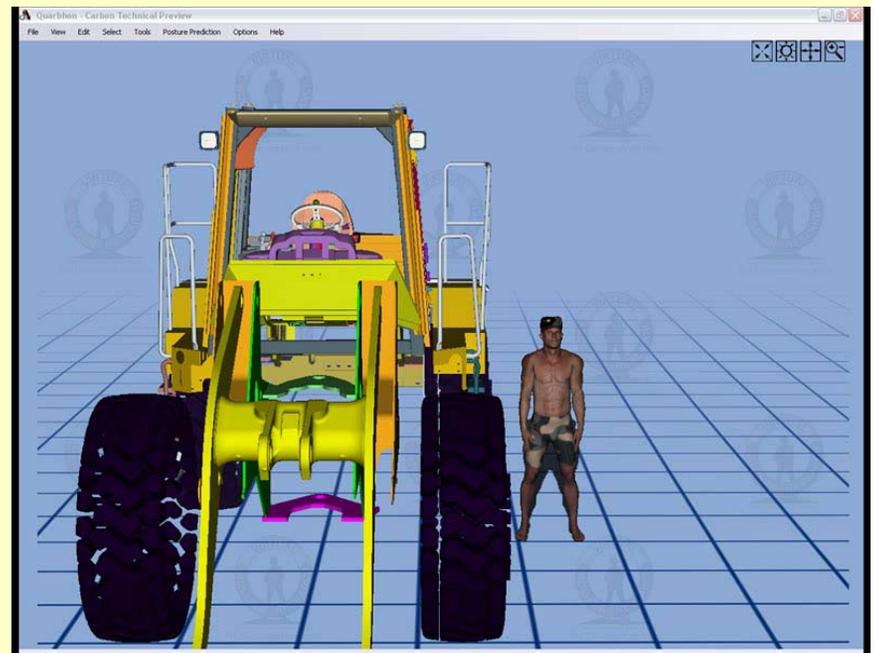
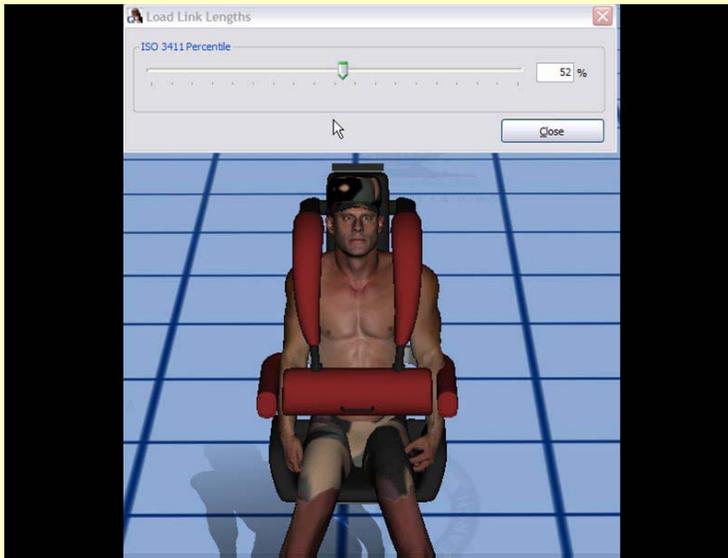
Multifunctional fabric
Flexible most of the time, the battle suit fabric would stiffen automatically in response to ballistic danger or on demand in a medical emergency.

Artificial muscles
Connected to an exoskeleton, these would provide extra strength.





Videos



Leveraging Battelle Funding

THE UNIVERSITY OF IOWA **IOWA** Centers for Enterprise

- Incorporated as *Santos-Human, Inc.*
- IP Protection
- IP Licensing UIRF
- Investors
- Sub-Licensing
- Partnerships with major corporations
- Will create 12 jobs in the next year



Battelle
Funding



STTR

Small
Business
Technology
Transfer



- ✓ Phase I
- ✓ Phase II
- ✓ NAVAIR



Virtual Soldier Research

Strategy

- ✓ Commercialization is in process
- ✓ Strategic partners that add value to Santos™
- ✓ Advanced research will continue at VSR
- ✓ Plans are to launch the technology worldwide
- ✓ Looking for employees & researchers

