University of Central Florida

At a Glance...
- 56,400 students
- 13 colleges
- A “Four-Year 1” (highest level) institution based on graduate program strength
- $140 million in 2010 research awards
- 95 master’s and 29 PhD degree programs
- 2nd largest university in US
- 2nd largest producer of CS graduates
- 1st in M&S and PhD in M&S degrees

Centers of Excellence
- Simulation and Training (IST)
- Optics & Photonics (CREOL)
- Energy (FSEC)

Simulation and Training Research at UCF
- Institute for Simulation & Training
- Center for Research & Education in Optics and Lasers
- School Electrical of Eng. and Computer Science
- Center for Applied Human Factors in Aviation
- Center for Advanced Transportation Systems Simulation
- Florida Photonics Center of Excellence
- Team Performance Laboratory
- Media Convergence Laboratory
- School of Film and Digital Media

Research Areas
- computer modeling ... virtual, augmented, mixed reality ... mathematical foundations ...
- physiology... psychology ... curriculum development ... distributed learning ... web-based systems ... simulation standards ...
- hardware prototypes ... robotic systems ...
- economic models ... performance assessment

UCF Stands For Opportunity
Where we are located
IST Staff

◆ Psychologists
◆ Educators
◆ Computer Scientists
◆ Engineers
◆ Instructional Designers
◆ Digital Media specialists
◆ Mathematicians
◆ Anthropologist
◆ Historian
◆ Cognitive scientists
◆ Actors
◆ Artists

Research faculty ~ 70
Staff ~ 15
Research affiliates ~ 10
Students (undergrad & grad) ~ 180
Institute for Simulation & Training

Current Academic Partners & Research Colleagues

- Institute for Human and Machine Cognition
- Penn State University
- UCLA
- Johns Hopkins University
- University of Maryland
- Purdue University
- University of Arizona
- Cal Tech (JPL)
- University of Illinois
- University of Miami
- Old Dominion University
- University of Massachusetts
- University of South Florida
- Texas A&M
- Carnegie Mellon University
- University of Pennsylvania
Institute for Simulation & Training

Research Support & Partnerships

- **Defense**
  - Office of Naval Research
  - US Army RDECOM
  - US Army Research Institute
  - US Army Research Office
  - US Army Research Laboratory
  - US Marine Corps
  - Air Force Agency for Modeling & Simulation
  - US Department of Defense
  - DARPA

- **Federal**
  - National Science Foundation
  - National Institutes of Health
  - National Endowment for Humanities
  - US Dept of Health & Human Services
  - NASA
  - US Department of Education
  - Federal Aviation Administration
  - Federal Motor Carrier Safety Administration
  - Federal Highway Administration

- **Industry & Foundations**
  - Simulation Interop Standards Org
  - Intelligent Automation Inc
  - Stottler-Henke Associates
  - Alion Science and Technology
  - Lockheed Martin
  - General Dynamics
  - Dynamics Research Corp
  - Aptima, Inc.
  - United Cerebral Palsy
  - Milcord LLC
  - CHI Systems Inc
  - Link Foundation
  - Robert Wood Johnson Foundation
A sampling of research efforts
Simulation Types

• Physical Science Based
  – Process Models
  – Physics
  – ...

• Human Centric
  – Human in the Loop
  – Modeling Cognitive Processes
  – Modeling Human Behavior
  – Human – Machine Interaction
What does game-based training need to make it effective?

How are technologies affected?

Currently use G-DIS

- VBS2 is under consideration

Focus is on distributed after action review capabilities

- Microphone
- Telestrator

AAR

- SOCRATES, our AAR engine
  - DIVAARS
  - JTACAARS
- Visual augmentations to aid understanding
Virtual & Mixed Reality for Medical Applications

Assessment for stuttering in an MR restaurant

Physical rehabilitation
Mixed Emerging Technology Integration Lab (METIL)

Go for the Green
Mobile learning sales game with a golf theme on iPhone, Blackberry, Symbian and Windows Mobile

Mobile My Sports Pulse Challenge
Mobile Simulations for Science, Technology, Engineering and Math (STEM) Education

Innovative integration of 3 domains:

**STEM Education** to improve students interest and future technical entrepreneurship opportunities

**Sports Theme** to expand audience, promote interest and provide extrinsic motivation

**Mobile Technology** for delivery to a young, broad audience, reaching millions internationally

Microsoft
Mobile SCORM-conforming courses

DAU Sim Cards
Classroom, Online, Mobile and Virtual World Learning Scenarios

Learning, Knowledge & Cognition

Mobile
Games and Simulations
Virtual Worlds
Collaborative Technologies
Web 2.0 and beyond

Johnson & Johnson PRD
3D University

Corporate Mobile Learning, Virtual Worlds and KM/Collab

PMESII Catalog
Community-editable database wiki for irregular warfare simulations
M & S Tools for Healthcare Applications

Wireless, unobtrusive physiological sensor suites and the software to integrate them

Virtual space research environment

Game-based learning and haptic training devices
Cognitive rehabilitation

Patient and therapist in context of patient’s kitchen but in safety of clinic

Current effort – TBI assessment in a virtual warehouse environment
Capabilities

The RAPRTER group comprises of:

- Instructional Designers
- Game designers
- Web designers
- Simulation designers
- Educational researchers
- Student researchers
- Performance Technologists
- Computer scientists
- Subject matter experts

Applications

- Formative Evaluation
- PC Games
- Simulators
- Mentoring
- Testing
- In-service
- Workshops
- Partnerships
- Formative Evaluation
Pain Management for Nurses
Pilot project to for student nurses in learning about pain management
Virtual & Mixed Reality for Teacher Training

Virtual Classroom for complex interaction

In front of class

At desk of student

Personal contact
Human Systems Integration Research

Some Current Projects

- Cultural modeling
- Patient Safety
- Team Cognition
- Training
Virtual Heritage - simulation in history

- Application of 3D modeling to history
  - Shadows of Canaveral
    Flash based experience providing an examination of the launch facilities and culture of Cape Canaveral in the 1950s/1960s.
  - Come Back to the Fair
    Full 3D environment based on the 1964/65 New York World’s Fair. Designed to provide an avenue of learning between STEM and arts/humanities.

- Digital Image Access Classification Research
  - Digitization of 60,000+ images.
  - Dissemination of informational content of images.
  - Researching distinction between subject and ‘aboutness’ of images.
  - Researching 3D online archive interfaces.
How do you make it work?

I have no definitive answers,

I do have heuristics and hints
How do teams work?
Features of Effective Teams – The Big 5

The role of the management environment

• Interdisciplinary thinking starts at the top,
  - And extends to every level
  - Organization and group identity important

• Very useful if organization not within one college
  - Also disadvantageous
  - Appointments, roles, money

• Not all great researchers can work well in a group
  - Choosing collaborators well is key

• Long term association is important

• Build, maintain an excellent support infrastructure
The physical environment can help
The role of food

• Free lunch a good motivator for meeting and noon a good time to have a meeting

• Something like a “lunch & learn” can help brief current research
  provide food, but intermittently (Vegas rules)

• Have intermittent food events
  experiences with cookies, ice cream, and pie
Questions and Discussion