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Implementing Immersive Virtual Reality in an Aviation/Aerospace Teaching and Learning Paradigm

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Agenda

- Training in Immersive Environments
- Virtual Space in Education & Training
- Creating & Implementing a Virtual Space
- The ERAU Lab: Capabilities & Technologies
- Future Opportunities
Training in Immersive Environments

The Virtuality Continuum

Aksenova, 2013, adapted from Milgram & Kishino, 1994
Virtual Space in Education & Training

• **Education**: collaborative learning, enhanced systems training, gamification, enhanced visualization of materials

• **Medicine**: integrated systems to aid surgery, patient rehabilitation in a virtual environment

• **Military**: virtual training environment, head-up displays (HUD) and head-mounted displays (HMDs)
Creating & Implementing a Virtual Space

• Mission and Purpose of the ERAU COA ARVRMR Lab:
  • To explore, develop, and test immersive simulation technologies for use in aviation research, teaching and learning

• Benefits of having a Virtual Space
  • Undertaking of high-risk tasks
  • Demonstrating effects of actions
  • Completing repetitive tasks
  • Increasing cognitive processes
  • Customizing performance-based training
The ERAU Lab: Capabilities

Cessna 172 Virtual Walkaround

F/A-18 Hornet VR Receiver Aerial Refueling
Part-Task Trainer

Mission: ISS VR experience
The ERAU Lab: Technologies

• **Equipment:**
  - HTC Vive Pro HMD system
  - Custom Graphics PC Workstation, 4.2 GHz Intel i7-7700K CPU, GeForce 1080 Graphics Card
  - Oculus VR headset
  - AVT Simulation and U.S. Navy Naval Air Systems Command F/A-18 Hornet VR Receiver Aerial Refueling Part-Task
Future Opportunities

- Simulation training efficiencies
- FAA Airman Standards
- Gamification
- Military and commercial pilot training
- Physiological testing and training
Questions?
Thank you from the ERAU ARVRMR Team

- Mike Bakula
- Ken Byrnes
- Kim Chambers
- Zachary Colman
- Antonio Cortés
- Andy Dattel
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- John French
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- Stephanie Fussell
- Kris Hammer

- Tom Haritos
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- Raul Rumbaut
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- Brent Terwilliger
- Tyler Wise