

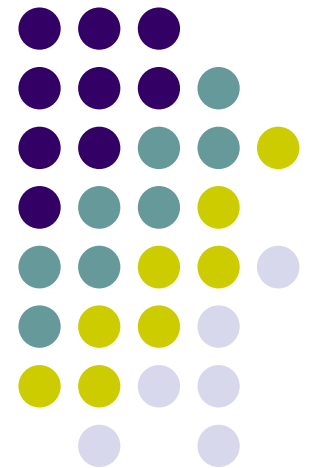
Virtual Simulators as Alternate Training Techniques for Construction Equipment Operators & Generation X and Y

Adam M. Gerson

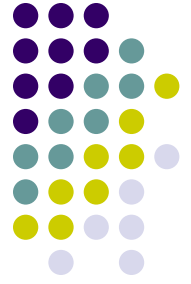
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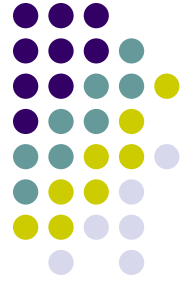


Overview of Presentation

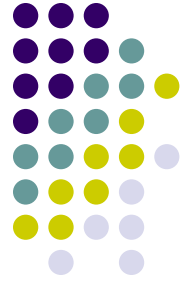


- This is a technology overview of applications of virtual simulations to improve workplace safety & health, with a specific focus on the construction industry
- The PPT is not an overview of the new OSHA Training Guidelines that are posted on the Federal OSHA website -
https://www.osha.gov/dte/outreach/construction_generalindustry/guidelines.html
- The PPT was originally created for the Residential Construction Safety Group of the Master's Builder Association for a presentation in August 2010
- Although the speaker is from federal OSHA, this is not a Regional or National OSHA initiative
- Providers of material were contacted before their content was included in this PPT

Overview of Slide Presentation



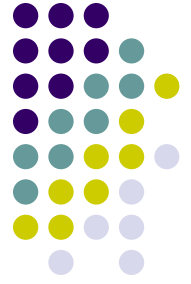
- What are Video Games, the Serious Game Initiative (SGI), and Teaching Simulations?
 - Types of Virtual Simulations
 - Potential utility for construction workers and workplace safety & health
- Examples of virtual simulations to improve health management, construction and workplace safety
- Videos & demonstrations of simulations



What's a video game?

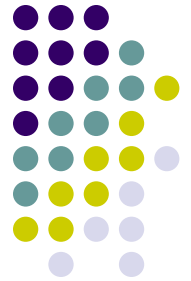
- A **video game** is an electronic game
- Involves interaction with a user interface
- Generates visual feedback on a video device
- The electronic systems used to play video games are known as platforms
 - examples – PC's and video game consoles.
- Video games use a variety of ways to provide interaction and information to the player.

Video Game / Simulation Genres



- Core games - dedicated strategy on video console
- Smart phone games
- MMOG or Massive Multiplayer Online Game
 - An example would be World of Warcraft
- Serious Games
- Teaching Simulations

Video Games would seem ideal to Motivate Generations X, Y, & Millenium

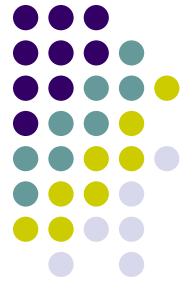


- **Think “Smart Phones”**
 - Multitasking is OK
 - Collaboration
 - Structure
 - Technology
 - Online Communication
- **How can technology be utilized by trainers to engage younger audiences????**
 -the serious game initiative and teaching simulations

What are “Serious” Video Games, and how are they utilized?



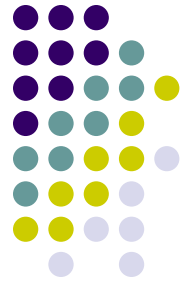
- **A serious game** is an interactive video game designed for a primary purpose other than pure entertainment.
 - Environmental message games
 - Educational games
 - Medical Visualization
 - Health Related Games
 - Corporate Training
 - Advertising Games



Ongoing Research into the Serious Game Initiative

- Microsoft – Games for Learning Institute (G4LI)
- Michigan State University – Serious Game Curriculum
- Wii Rehabilitation Research
 - Use of Wii for Parkinson's or Physical Therapy
 - University of Toronto – Pediatric Rehabilitation Engineering
- DARPA / US Military Simulations

Examples of Serious Game Initiative in Practice for ESL/EFL Training



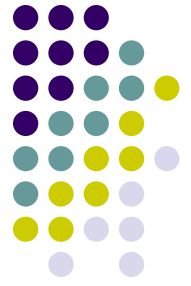
- English as a Second Language Training available on the internet
 - Actively promoted by Larry Ferlazzo
 - California High School Teacher
 - Prominent Blogger and with ESL Top Ten Lists
- Hyperlink to examples of content....
 - <http://larryferlazzo.edublogs.org/larry-ferlazzos-english-website/>

While Serious Games are a tangent of video games... they are slightly different than Teaching Simulations



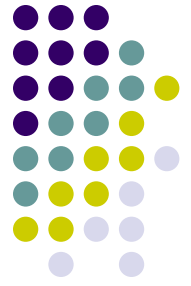
- Construction & heavy equipment training simulations do not function like typical video games
- They are designed to orient an operator with a mode of operation, and oversee their progress
- Pace of training is relatively slow (on purpose)

Why would you utilize a Virtual Simulation oriented for Teaching?



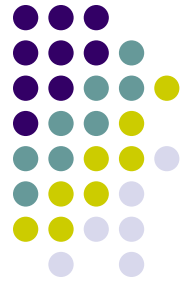
- Simulators allow for classroom teaching by demonstration
- Workers with Tactile Intelligence, or those who are exceptionally good with their hands, can learn by doing
- Simulators allow operators to learn from near misses in a controlled environment
- Performance can be remotely monitored by instructors

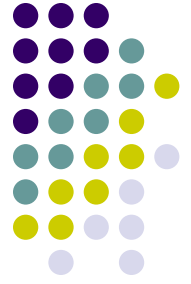
Examples of Virtual Simulators for Heavy Industry and Workplace Safety & Health



- Simulations for Oil Rigs & Offshore Energy
- Virtual Incident Management Training
- Ireland – Safety Game for HSA
 - Visual review of workplace standards and hazards
 - Currently in development

Serious Game Simulation by Coole Immersive for Oil Rig Safety



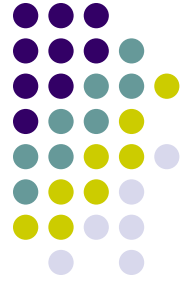


Cooler Immersive – Service Rig Trainer

- **Features of the Oil Rig Simulation**

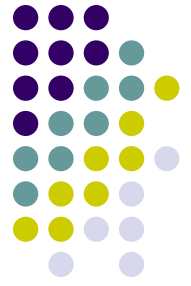
- 8 Categories and 57 work methods for the 4 roles
 - Jr. Floorhand, Sr. Floorhand, Derrickhand and Operator
- Multiple interactive training operations for each role
- Glossary of over 700 terms with visual reinforcement
- Task specific video and instructional voice over
- You Tube Link –
 - http://www.youtube.com/watch?v=TnnZ-5rX1OA&feature=player_embedded

Virtual Incident Response Training



- **I-95 Corridor Coalition**
- They are creating an intensive training program that uses three-dimensional, multi-player computer gaming simulation technology
- Utilize distance-based learning technologies to test incident management practices
- “Multi-Player” across the Coalition region

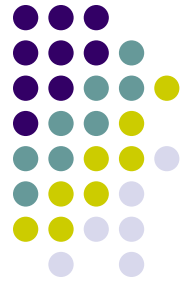
Screen Shot and User Interface for I-95 Incident Response Training



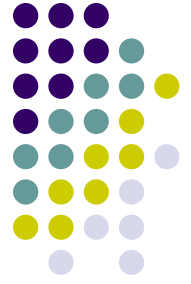
Sim Ops Studios (Code 3D) - Incident Response Virtualization Screen Shots



Silvertongue Software – Safety and Health Game under development for Ireland HSA

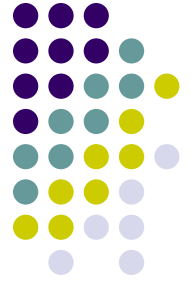


Examples of Mining & Construction Simulators

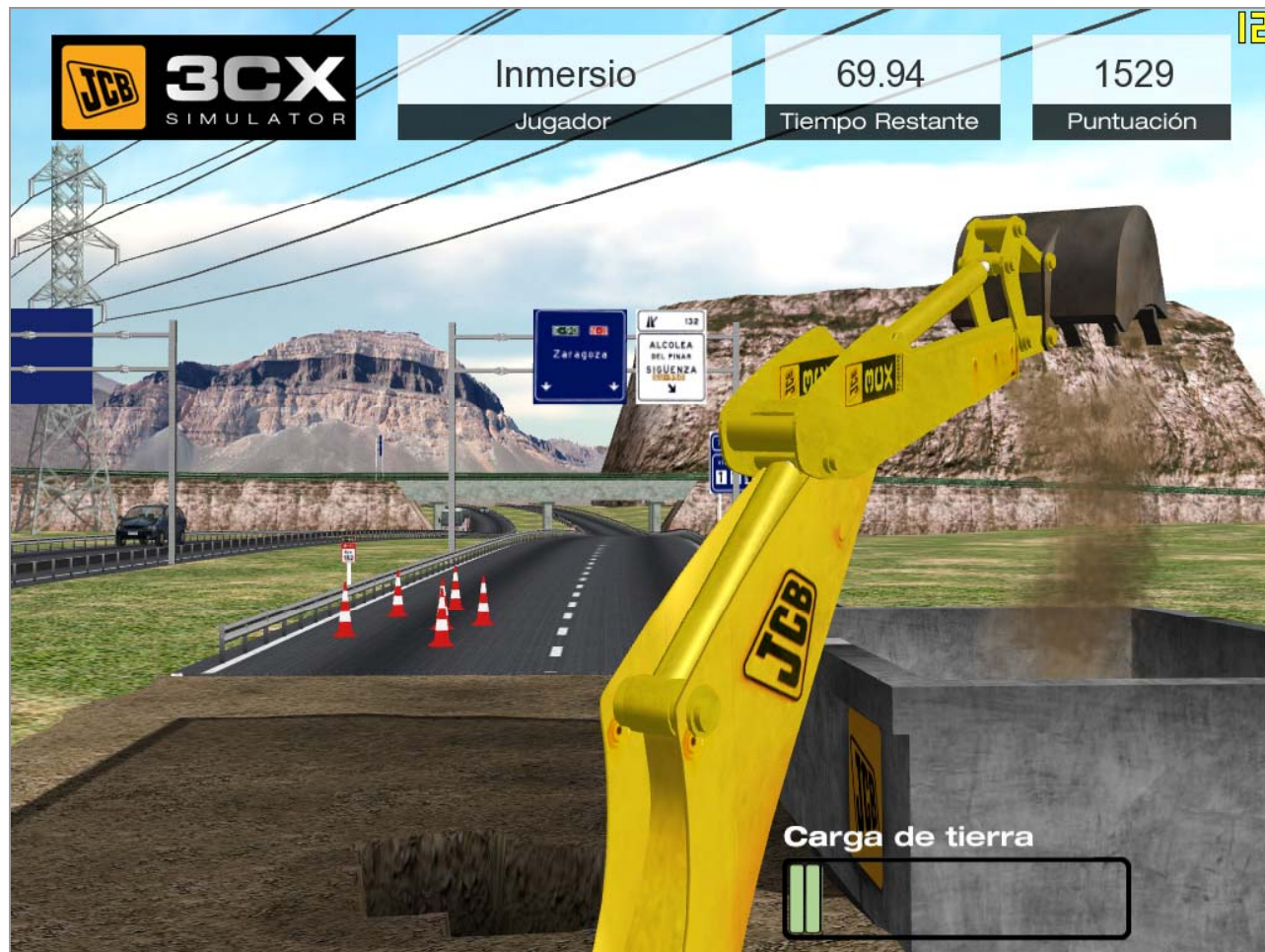
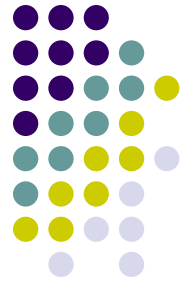


- Valmet Komatsu Forestry Simulator
- Excavator Simulator JCB 3CX
- Simlog - Construction Equipment Simulation Software
 - 3D simulation for heavy equipment operators in the crane/construction, forestry, and mining industries.

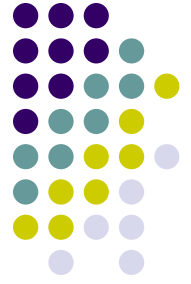
Valmet Komatsu Forestry Simulator



Excavator Simulator JCB 3CX

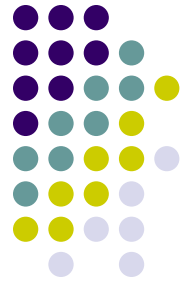


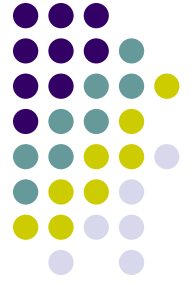
Simlog training descriptions(from their website)



- Each Construction equipment simulator provides training and facilitates objective evaluation in the following areas:
 - Training and evaluating novices in the proficient operation of equipment
 - Providing a new-recruit screening system
 - Providing effective refresher training for experienced operators
 - Instilling the theory and practical aspects of economical mining
 - Providing training in emergency situations not possible on the real equipment
 - Entrenching safety procedures

Simlog – Construction & Mining Equipment Simulators



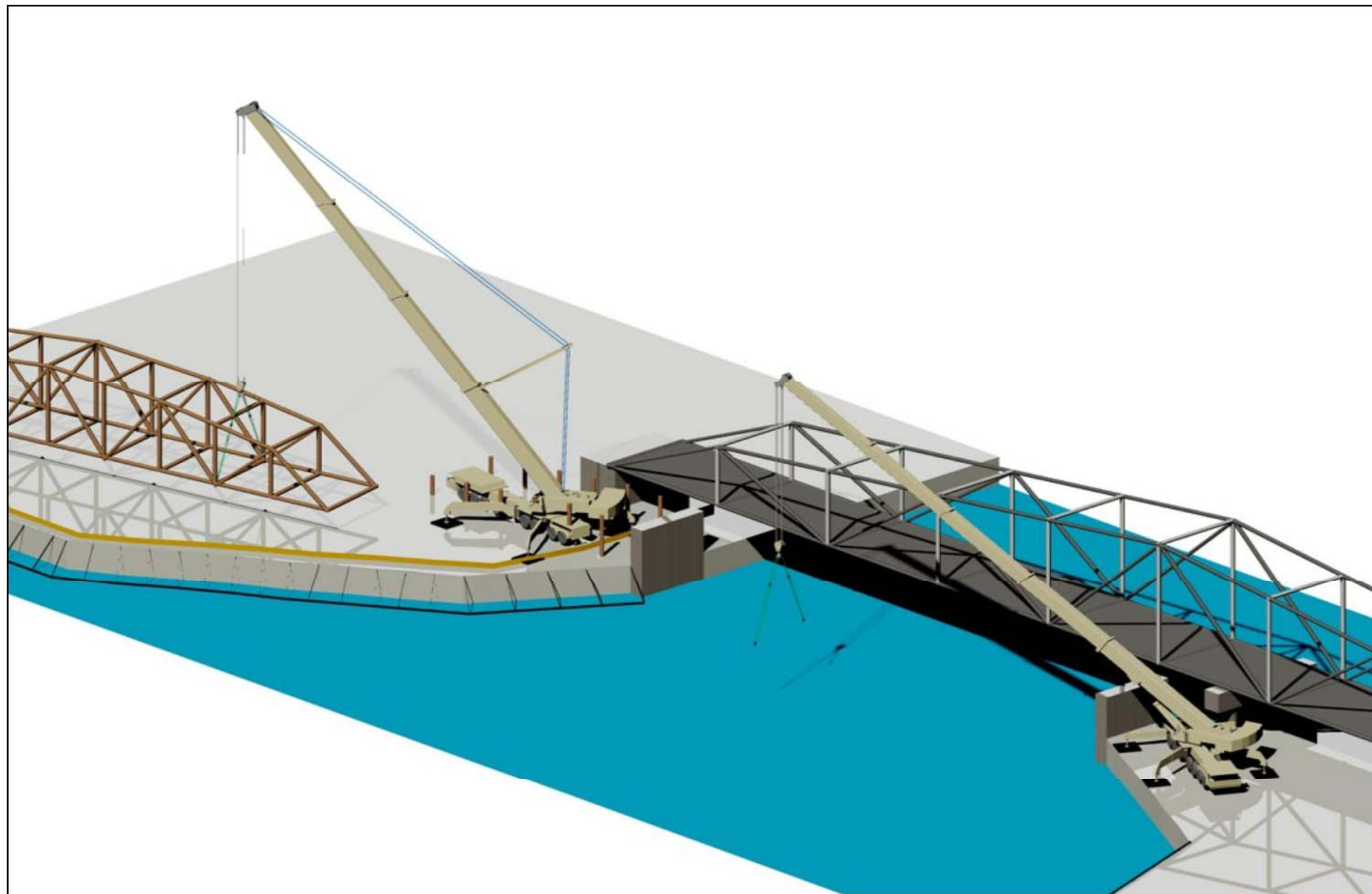


Example of Virtual Simulation to Assist Pre-site Planning

- **Sicklesteel Crane Simulation**

- Facilitated a 2009 bridge demolition over the Sauk River in NW Washington.
- Sicklesteel utilized a crane simulation software called LiftPlanner
- This software interacts with AutoCAD
- It allows a designer to precisely model a worksite as well as position and configure cranes in 3 D Space
- AGC Technology Award Winner for 2009

Picture of “Lift Planner” Crane Visualization

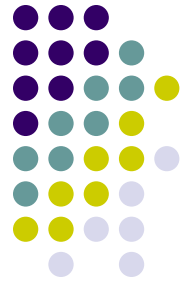


John Deere Virtual Equipment Simulators by Southwest Research Institute



Example of Cost Assessment for Construction Equipment Trainers

Examples of John Deere Simulators by Southwest Research Institute



Excavator Simulator



4WD Loader Simulator

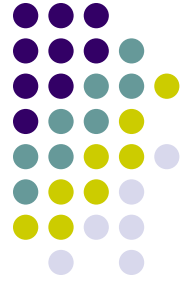


Motor Grader Simulator

Related Link to John Deere Simulators (Prices Quoted from Website as of 07/14/10)

http://www.deere.com/en_US/cfd/construction/deere_const/training/level2/excavator_simulator.html

Example of Realistic Controls for Excavator Simulation



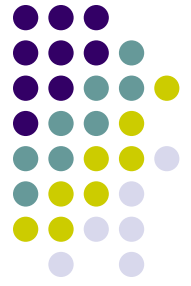
Joysticks



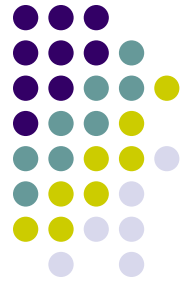
**Foot
Controls**



Excavator Virtual Simulation Software and Realistic Controls - \$9,976

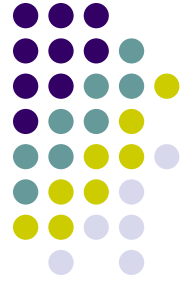


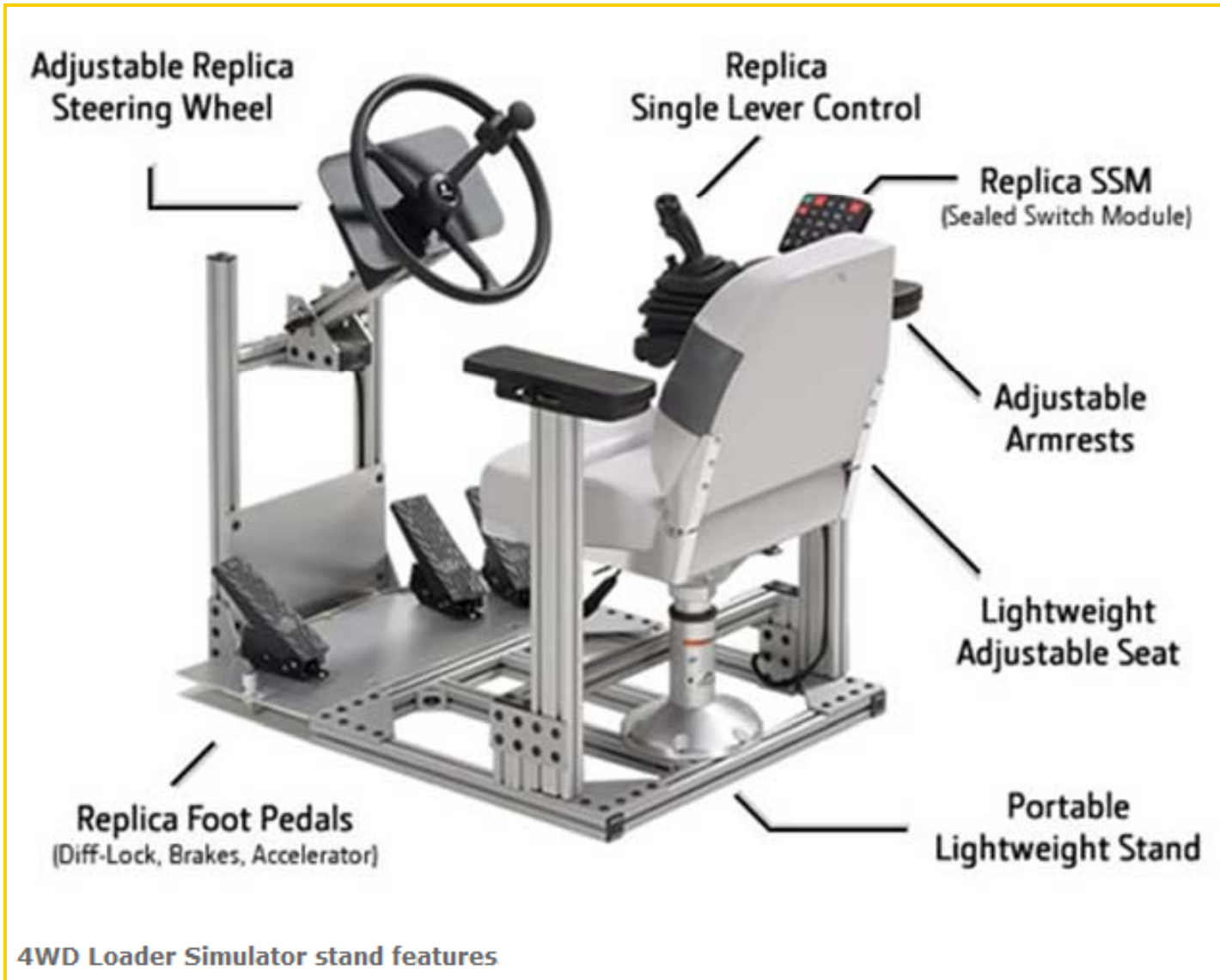
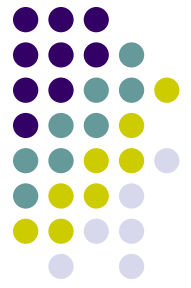
Software Only Option for Excavator Simulation - \$4,776

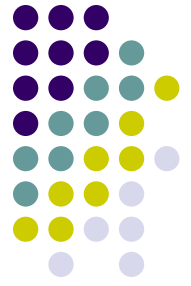


**Excavator Simulator Software Only
Gaming Controllers Option**

4WD Loader Simulation with Software and Realistic Controls - \$15,997

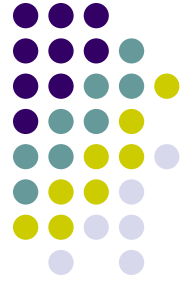






Teaching Simulations...

- A tangent to video & serious games
- Allows for classroom teaching by instruction
- Software enables remote monitoring of performance
- May be especially useful for workers with Tactile Intelligence
- Realistic pace of equipment operation as opposed to “video game speed”
- There are many teaching simulations already on the market



The upcoming slides are website demos of of Virtual Simulations

Examples of Content –

1) Siqur

Safety & Health Training w/Video Game Controls

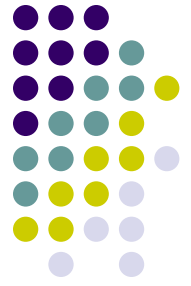
2) Vista -

Construction Equipment Simulations

3) Caspian Learning “Thinking Worlds”

WYSIWYG Editors for Virtual Simulations

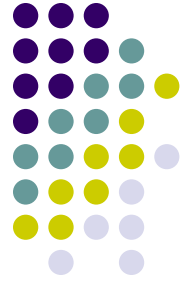
Videos and Demonstrations of Virtual Simulations for Workplace Safety & Health



- **Siqur – Interactive Safety & Health**

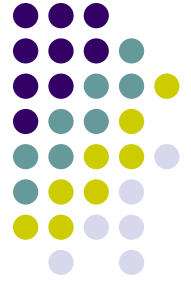
- www.siqur.com
- Can utilize USB XBox Controls to manipulate training environment
- This simulation trains users in Fire Safety for a residential environment
- Metrics and collaboration are integral parts of the Siqur training environment

Demonstrations of Virtual Simulations for Construction and Workplace Safety & Health



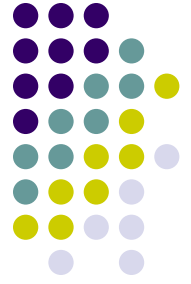
- **Vista Video Overview of Caterpillar Hauling Truck Simulation and Training Software**
 - <http://www.vista-training.com/trucklogic/>
- **Text from their website....**
 - “This new program combines web-based training, simulation and on-the-job tools into a comprehensive, integrated curriculum designed to help adult learners retain much more of what they've been presented. Because it's web-based, you can train new operators at any time, at any location with internet access, using only a web browser.”

Caspian Learning – Thinking World Browser Based Sims



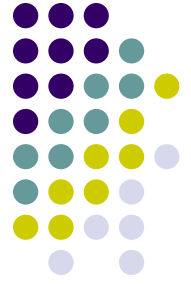
- Browser Based Simulator called “Thinking Worlds”
<http://www.thinkingworlds.com/>
- Add different worlds, characters and objects from libraries - templates, wizards and icons using simple drag and drop.
- Demos include:
 - Oil Rig & Safety
 - Military Checkpoints

Sources of Information on the Serious Game Initiative and Teaching Simulations



- **The Escapist**
 - <http://www.escapistmagazine.com/>
- **Serious Game Blog of Eliane Alhadeff**
 - <http://elianealhadeff.blogspot.com/>
- **PixeLearning – Serious Game White Papers**
 - <http://pixelearning.com/>

Thank you for your time...



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