ELG 5124: Virtual Environments (Winter 2008)

Tuesday and Thursday, 11:30-13:00, in STE 0131

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Marking system:

Assignments ... 10%
Project report ... 50%
Final exam. ... 40%

Calendar description

Rationale
Virtual environments represent a rapidly emerging technology, which can be defined as "a way for humans to visualize, manipulate and interact with computers and extremely complex data." Computer generated visual, auditory or other sensual outputs to the human user can be mixed with the sensor-based models of the real world to generate a "virtual world/environment" within the computer. This world may be a CAD model, a scientific simulation, a computer game, or a view into a database. The user can interact with the world and directly manipulate objects within the virtual environment. Some worlds are animated by other processes, physical simulations, or simple animation scripts. This technology has already found promising applications in the industry, communications, telerobotics, medicine, and entertainment.

Detailed course outline

Virtual Environments (VE) - basic concepts.
Historic development. Basic concepts: viewpoint, navigation, manipulation, and immersion in VE. Multidimensional virtual worlds. Hardware and software for VEs. Application examples in industry, multimedia communications, medicine, entertainment.

World Modeling.

Anthropomorphic Avatars.
Computer facial modeling and animation, human body modeling and animation.
Animation.

VE interfaces.
User-interaction modes. Human-machine interfaces. Visual, position, tactile, force, and sound interfaces (sensors and feedback) for VE interfacing with the real world and human users. Human-computer symbiosis.

Case studies.

References


Related websites:
http://web3d.about.com/ - 3D Graphics/Virtual Reality