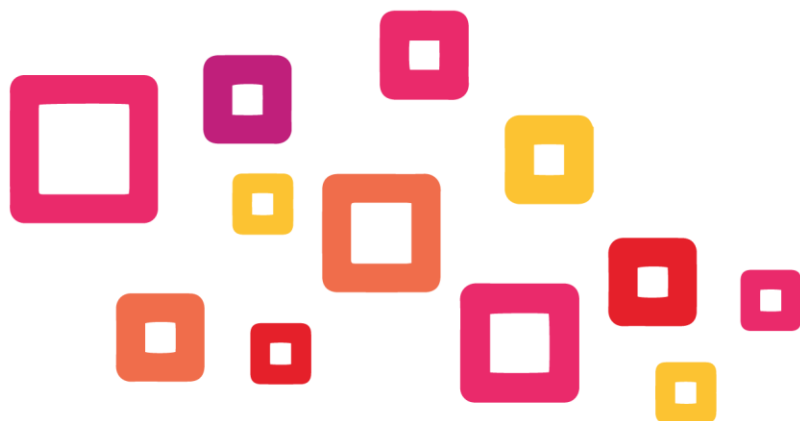


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Virtual Collaborative environment (tools 2.0)

Subunit 3: Virtual Enviroments Use and Examples



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Introduction

This section shows several examples of CVE applications used in practice. The examples are trying to cover just the most important areas to show the overview of CVE domains Collaboration and interaction:

- **military simulations: VR Group, DIS**
- **engineering software: CollabCAD, CoCAD, CyberCAD**
- **network games: DOOM, Age of Empires, Couter-strike**
- **interactive groupware: EVO, videoconferences**
- **Computer workload distribution**
- **distributed rendering: Toy Story, Distributed Radiance**
- **distributed simulations: DIS, weather prediction, NASA simulations models are taken into consideration.**

1. USE AND EXAMPLES OF CVE

Collaboration and Interaction: Military Simulations

Military simulations were the first place where CVE started to be widely used in the 80's. At the present time, they are still used, especially for training purposes, because the virtual training is cheaper than the real training with real tanks, buildings, and airplanes fixes. Virtual reality apps usually requires large amount of disk space (aprox. 20-30 gb) . We also know other non-commercial VR platforms that are developed for individual customers.



Figure 1: Military simulations

VR Group

VR Group [VR Group] is a company developing army training simulation software based on DIS [ANSI 1993]. It is used mainly for Army of Czech Republic. The simulation is composed of a model of real or virtual landscape that is rendered in real time.

DIS – Distributed Interactive Simulation

Distributed Interactive Simulation (DIS) [ANSI 1993] is the first widely used system in its area. It was developed for Department of Defense of United States for tactical army simulations. The success of DIS led to its standardization process for distributed simulation applications. The system is based on units representing fighters, helicopters, tanks, refueling stations etc. that are exchanging messages among themselves. The messages are for example: position update, amount of damage caused, refuel request, etc.

Collaboration and Interaction: Engineering Software

- CollabCAD

CollabCAD is an active project (<http://www.collabcad.com>) for 3D CAD/CAM design. It enables several people to work and collaboratively interact with the shared data set. Video and audio channels among the participants are provided by the 3rd party applications.

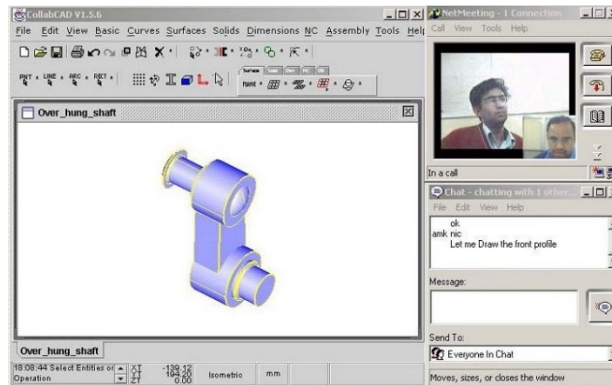


Figure 2: CollabCAD

Collaboration and Interaction: Interactive Groupware

Interactive groupware includes video and audio conferencing software, such as EVO (see figure 10), Netmeeting, and Skype. It includes also chatting software, like ICQ, Jabber, IRC, MSN, and many others. These applications often share common data and they require concurrency control that is sometimes similar to the concurrency control models used in CVE systems. However, they are often not considered CVE systems because their datasets does not represent virtual environments and many optimizations and techniques from collaborative virtual environments are often not applicable to these datasets.

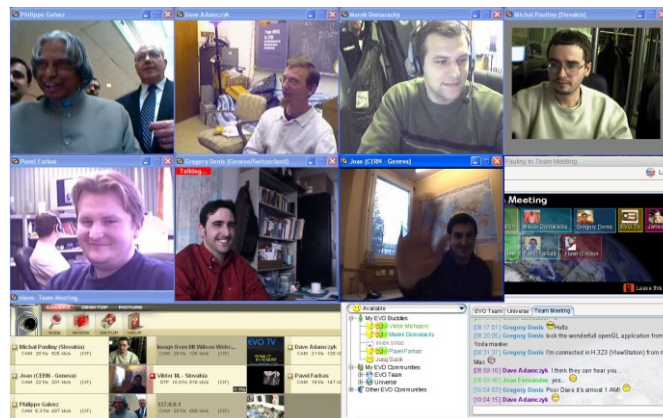


Figure3: EVO

Collaboration and Interaction: Computer Games

Computer games are often mentioned throughout this thesis because it is a quickly growing market and its influence on the research in computer graphics can not be overlooked now for the high economical potential of the entertainment industry. Computer game industry started its interests in CVE systems when the first network multiplayer games appeared. Several people were able to be virtually present in one shared virtual environment. Just three games are mentioned here as typical representatives of different kinds of collaborative networked games.



Figure 4: Computer game

Virtual events

INXPO is a virtual event platform to extend event reach, monetize content and create community.

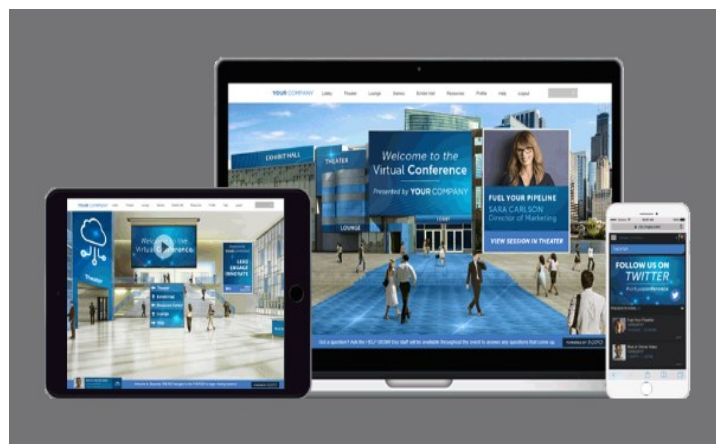


Figure 5: INXPO virtual event

Distributed radiance

Radiance [Ward 1994] is photorealistic rendering system based on ray-tracing techniques. Raytracing is extremely computationally expensive. University of Bristol is investigating possibilities of rendering acceleration by parallel processing on the cluster of computers [Debattista 2007]. Some plans even exist for a project of real-time radiance on a large cluster of computers.



Figure 6: Radiance

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