Collaborative 3D UIs

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Terms

• **Networked**: components of VE running on separate machines connected by a network

• **Distributed**: non-centralized; pieces of the environment on separate machines

• **Collaborative**: multiple users working together
Examples

• **Networked**: graphics, trackers, and sound on different computers

• **Distributed**: 3 virtual creatures, each one’s behavior and geometry are computed on a different computer and sent to user(s)

• **Collaborative**: 4 users sharing the same 3D molecular model (maybe co-located)
Applications

- Military simulation / training
- Collaborative design
- Persistent multi-user worlds
- Online communities
- Education
Collaboration challenges

• “Natural, spatial” human-human communication
• Peripheral awareness
• Unification of communication and information
• Frames of reference
• Large number of participants
• Large amount of data
• Cooperative interaction
Data visibility

- Individual user needs to know only a small portion of the total available information
- Aura-nimbus approach [Greenhalgh]
- Area-of-interest filters
Cooperative manipulation