
CONCURRENCY IN A REAL-TIME MULTI-USER SIMULATION

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Current methods of Real-Time simulation involving multiple users are non-scalable, difficult to develop, difficult to maintain, and expensive. Concurrent computer usage is exploding. The ability to edit documents, 3D models, and interact with multi-user simulations by users who are remote from one another is an emerging technology. Current techniques do not scale well and require a large infrastructure investment. This research addressed issues in which existing infrastructure of the clients' PCs can be leveraged to the computational demands of distributed interaction. In this research, I investigated the feasibility, of a thin server – peer client architecture for real-time multi-user simulation. This project involved a number of issues in simulating a shared environment on multiple computers, with multiple users in real-time. These issues included: latency, synchronization of state, events, clients coming into or leaving the simulation, security, and privacy. Solutions for data conflict resolution that were investigated included distributed state verification (peer voting) and master-client (one or more clients are designated as arbiters of truth).