Universe

a proposal for a new form of interactive entertainment
by
Chip Morningstar

Lucasfilm Ltd. Games Division
21 September 2020

Introduction

What's happening — some technical observations

Basic data communications hardware is becoming cheaper and cheaper. We are beginning to see widespread ownership of low-cost modems. We may be about to witness the advent of mass-produced personal computers that have modems and modular jacks built in. In addition, home computers are finally beginning to appear on the market which approach a programmer's notion of reasonable cpu power, memory size and disk capacity, such as the Macintosh, possibly the IBM PC-AT, and newer machines rumored or announced — Amiga and the Atari ''Jackintosh''. The coupling of these developments suggests an interesting opportunity to create multi-player computer games conducted over telephone lines.

Distributed games

Consider a game like Peter Langston's *Empire*. Although it was designed for multiple players playing it together in a single-host time-sharing environment, in many ways each player is independent. Potentially, each player could start the game on his own computer if all the players shared some common, mutually agreed upon random number seed from which to generate the world. Each could then play along with only periodic contact with the other players' machines to synchronize the state of the world, conduct combat, transmit diplomatic communications, etc. A master computer (the non-evil variety) could handle the coordination and communications needs of the game by maintaining a central database. This central database would represent the *Empire* world in which all the players would be simulated inhabitants. The game world would be updated for the players whenever their machines logged in to the central host. The host would perform the actual database manipulation, and simply accept data from and transmit data to the players' local computers, without letting them actually run programs (i.e., the host would not appear to the players as a general-purpose time-sharing system but as something more like an ethernet file-server).

Compuserve? — *yuck!*

Of particular interest is the potential for using the players' home machines' considerable processing capability to fashion a loosely coupled system. There are disadvantages to having to maintain *continuous* communications between a game player's local computer and some centralized host, even though this is the way that many, if not most, public-access systems work. In such a case the player's home computer is usually acting as nothing more than a conventional terminal. There are several problems with this. First, most of the processing power of the player's machine is simply wasted. Second, communications costs, even in this ''information age'', are still comparatively high. Maintaining a connection for several hours at a stretch can run up a pretty big phone bill, which in turn can discourage potential customers. Third, the centralized host must be fast enough to keep up with a great number of simultaneous users and have large numbers of I/O ports with which to talk to them. This in turn contributes to the host's operating cost and ultimately to the connect-time charge that the user gets socked with.

An alternative architecture

Instead of maintaining continuous contact between two machines, where the local machine simply passes the user's input on to the remote machine, we could use the local machine's own capabilities directly. To do this, we arrange to have all of the interactive virtuality of the game provided by the local computer. Players would buy a program in a local store to run on their home computers. Each copy of this program could have its own serial number to provide each player with a unique identity from the moment he or she first boots it up. All the home machines running the program would communicate with the single large centralized host (a machine such as a VAX or a big IBM hog) over the phone or Telenet or cable TV lines or whatever's cheapest and most convenient. The player's home computer would handle all of the real-time interaction of the game. It would display data quickly and graphically. It would accept the user's input and figure out what it means. As it does this it would store up commands and queries for the remote system. According to some scheme (like a schedule, or perhaps just as needed), it would call up the remote system and exchange a brief flurry of highly compressed, abstract packets of data.

Another difference between this design and services offered by Compuserve and the like is that we could dedicate our system to the game. We wouldn't be offering a general-purpose, multiple-service system. Our host would be communicating with computers running software of our own devising rather than with vanilla terminals. The level of interaction that the host would have to support would consequently be much lower. Since the average connect-time per player would be less than that required by a continuous-connection system, the number of players logged in at any given time could be a small number in comparison to the total number in the game. This means that the number of incoming communications lines required and the amount of host I/O and CPU bandwidth required could be less than that needed to support a conventional terminal-interactive game of similar scope. This in turn means that the cost to establish and support the host system could be less (on a per user basis) than the cost of a conventional system performing essentially the same task. In addition, the host system could be optimized for handling the game. This all means that the requisite hardware resources and consequent support overhead (per user) could be less, and we would therefore (I hope) be able to charge the players less than Compuserve or its brethren while at the same time providing a more interesting game.

Universe

While many possible settings, themes and game concepts may spring to mind for such a system, one notion in particular appeals to me. Let's have a large (i.e., *apparently* unbounded) simulated universe with worlds, star systems, alien races, different types of technology, and well-defined physical laws. When the player starts the game, he perhaps finds himself in much the same situation as he would in *Empire*: sitting in an expanse of unowned wilderness in a relatively primitive state of development with some standard amount of starting resources. He would then expand from there, developing his industrial base, moving over the world and ultimately out into space, encountering other players and generally having a grand old time.

Epic scope

The difference between this game and *Empire* is largely one of scope. We would support a much larger number of players (*thousands*) in a much larger and more diverse and more open-ended universe. The universe would have its own abstract existence independent of the players. The system administrators (that's *us*) would liven the game up in the fashion of fantasy role playing games everywhere by placing alien artifacts, non-player characters and races, inhabited but unclaimed worlds, and so forth in the universe for the players to discover and interact with. In addition, since we would be devoting the player's whole home machine to information display and control functions, the game would be more interactively fluid and more visually and aurally stimulating than *Empire*.

The central idea

In essence, the player's home computer would become a window into an alternate reality in which the player would be a vicarious inhabitant.

Goals

I would like, then, to begin designing ‘‘a universe and its implementation’’. These are the goals for the design that I see:

—— The universe should be open-ended. It should not have any apparent physical boundaries, inherent resource limitations, or time limits. The overall game would not have any defined winners or losers or explicit goals for the players. Rather, as in *Empire*, the goals would be provided by the players themselves. Perhaps subsets of the game could be established that had victory conditions for those involved but which still took place in the same universe and required interaction with possibly non-participating players (rather like a scavenger hunt or a road rally in our mundane world).

—— The scope of the game should be large. A large number of players helps make the universe more interesting. A large universe provides room for a variety of experiences. The open-ended time scale enables players to develop their characters/worlds/personae as much as they would like. One consequence of the open-ended time scale is that players would be dropping out of the game and new players joining all the time. A large physical universe allows new players to be placed in remote locations so that they have time to develop and encounter similar neophytes before bumping into the experienced players who have developed powerful intergalactic empires.

—— The cost to play should be low. I’m tired of on-line services that cost several dollars an hour, expecting me to pay large sums of money simply because they’re ‘‘high-tech’’. I certainly couldn’t afford to get casually involved in something requiring that degree of financial commitment, and I’m sure I’m not unique in this regard. If the game is something that will appeal to only the most fanatical and devoted on-line system junkies, then the market is probably too small to support it. Keeping the cost down is one way to encourage wider participation.

—— It should permit people with varying time commitments to play and enjoy it. This is another aspect of keeping the audience as broad as possible. Obviously someone who is interested in killing a few minutes every so often is looking for something different than the person who is willing to commit several hours a week. The game could be set up to let someone who wanted to spend 20 minutes to, say, fly a reconnaissance mission or defend a planet from an invasion fleet, but also let someone who is willing to spend 10 hours start building an interstellar trading empire.

—— It should have the SF/interstellar theme discussed above. There are two reasons for this. The first is that the interstellar theme is particularly suited to the open-ended structure demanded. The second is that I’m currently the person spec’ing this game, and it’s what I want to do.

—— It should take advantage of distributed processing on home machines. This has already been discussed extensively above.

—— It should allow for different levels of interest and ability. Ideally such a game should be playable at a variety of levels depending upon player inclination and sophistication: as a zoom-thru-space shoot’em-up, as a game of exploration, as an economic simulation, as a diplomacy game; as a serious effort or as a light-hearted romp; as an occasional weekend diversion or as a full-time obsession.