

Data Driven Gaming

Directed Research Proposal
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Summary

With "Data Driven Gaming", I propose to investigate the use of dynamic data sources as a driving mechanism in video games. The platform for experimentation will be my thesis project, Torrent Raiders, and the dynamic data source will be actual bit torrent traffic. In order to successfully harness a dynamic data source as an input into a game system, a number of considerations must be evaluated in order to assess how to process the data into structures that will best serve the game. The objective of this research will be to determine how best to compellingly incorporate bit torrent traffic into the gameplay of Torrent Raiders.

Background

Incorporating dynamic data sources with interactive media has been an underlying thread of much of my work. Older projects of mine like MTRO_PLS and Carniforce are driven by a live music input and local network traffic respectively. These projects did minimal processing of their dynamic data sources and had a relatively direct correspondence between the data and the events they triggered. In MTRO_PLS, 3D buildings responded to specific sound frequencies with triggered animations. Carniforce spawned enemies that corresponded to specific protocols of data packets.

More recently, I created Digg Swarm, a real-time information visualization of the activity on Digg.com. With Swarm, the dynamic data was processed into more refined data structures that worked within a more complex system. This allowed Swarm to visualize its data in a more meaningful and aggregated way than if each incoming piece of information were directly mapped to a single event to fire off. Signal processing is an important practice in information visualization that I intend to employ in my approach to incorporating bit torrent traffic data into Torrent Raiders.

Torrent Raiders is an information visualization as well as a video game, so some of the lessons learned in the field of information visualization can be applied to my approach. Specifically, the strategies outlined in Ben Fry's Organic Information Design for ascribing properties of organic life to dynamic visualizations will be particularly applicable in visualizing a torrent swarm as a living, animated system.

Approach

A series of software prototypes will be created to assess the nature and shape of bit torrent swarm data across three parameters: throughput, interactivity and geolocation. The throughput phase will evaluate the frequency of peer-to-peer

and peer-to-tracker messages and analyze the file transfer patterns. The interactivity phase will explore the possibilities of mapping video game interactions to bit torrent protocol functions. An example of this might be shooting at objects representing peers in order to query them for a specific piece of the file. The interactivity phase will evaluate what level of interaction with actual bit torrent protocol functionality is possible and appropriate. The geolocation phase will explore the mapping of elements of the bit torrent swarm to geographical locations and aesthetic options for the maps themselves.

In each of these phases, the deliverable will be digital representations of the components of a torrent swarm illustrating the focus of each particular phase. This digital representation will be designed to suit the overall goal of a hybrid video game information visualization. These components include peers (leeches and seeds), downstream packets, upstream packets, completed pieces, the player, and the linked file itself. They will need to be visually represented in the game world and have unique behaviors suited to their role in the system.

The prototypes will be created using the XNA Framework and the btSharp library. An Xbox 360 controller will be the primary form of user input for the prototypes.

The overall goal of this research is to determine how these three aspects of bit torrent protocol can become input streams that will shape and inform the mechanics of a video game. The question guiding the research is this: how can representations of information be shaped in order to drive mechanisms in video game systems.

Timeline

September 11th

Begin throughput phase

Begin software framework for prototyping with XNA

September 25th

Complete initial throughput prototype

September 26th – October 2nd

Document MobZombies at NextFest

October 3rd

Begin interactivity phase

At this stage, user input will be incorporated so that a player may operate the interactions with the bit torrent swarm. Rough in-game representations of the components of the torrent will be created for this phase.

October 30th

Complete interactivity prototype.
Begin geolocation phase.
Integrate geolocation database functionality into XNA framework
Research importing vector file formats into XNA/3D

November 13th

Complete geolocation prototype.
Refine and iterate on previous prototypes.

December 6th

Finalize and publish documentation
Present research in final 511 seminar

Deliverables

- * Software prototypes demonstrating each phase of research
- * Documentation of research and analysis of findings.

References

Ben Fry's Organic Information Design
<http://acg.media.mit.edu/people/fry/thesis/>

The XNA Framework
<http://msdn.microsoft.com/directx/XNA/default.aspx>

The btSharp Library
<http://www.btsharp.com/>

My thesis research del.icio.us
<http://del.icio.us/adm/thesis/>

Torrent Raiders
<http://torentraiders.com/>

Digg Swarm
<http://labs.digg.com/swarm/>

Signatures

Advisor: Julian Bleecker

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