

Mark Claypool's MQP Projects



Network Games



Streaming Media

<http://www.cs.wpi.edu/~claypool>




March 2009

MQP Topics

Slide 1

Gameplay Programming on a Wii/DS Title

- **Sponsor:** ImaginEngine 
- Integrate into a project as gameplay programmers
 - As regular members of team
- Work on upcoming, unannounced Nintendo Wii and DS title
- Learn game engine technology
- Provide time estimates for assigned tasks
- Provide creative input




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Fox Engine Enhancement

- **Sponsor:** ImaginEngine 
- Enhance ImaginEngine proprietary game engine
- Review of:
 - Proprietary art production tool
 - 2D game physics engines
 - Networking and online solutions (via Flash)
- Provide:
 - Integration plan
 - Deliverable schedule
 - Target deliverables
 - Supplementary usage documentation
- Build prototype that proves the functionality


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LUA and Torque

- **Sponsor:** ImaginEngine 
- 1. Create a Lua mini-game API on the PC/Wii/and DS platforms
 - Exhibit a selection of mini-games using the technology
 - Use limited platform specific game code
 - Make use of shared asset pipeline
- 2. Integrate Lua and real time networking library into Torque Game Builder
 - Assemble prototype game that exhibits integrated functionality
 - Provide sample documentation

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Tools Development

- **Sponsor:** ImaginEngine
- 1. **Project Management Tool Suite**
 - Develop plugins for use in Trac
 - Develop tools to accelerate end user utilization of the system
 - + Task Analysis Tools for studio management
 - + Milestone and Task definition tools
 - + Client side tool for administrating tickets
 - + Perforce and Cruise integration
- 2. **Asset Management Tool**
 - Design and deploy asset management tool
 - Enable producers, artists, and engineers to:
 - + Specify requirements for new assets
 - + Facilitate the creation of and iteration on game assets
 - + Export of assets that have changed



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Virtual Robot Simulator

- **Sponsor:** 5th Gear volunteer development team
- 5th Gear simulates FIRST matches
 - Helps understand challenge, Improve driving skills, Develop strategy
 - Used by up to 40,000 students that participate
- 5th Gear Development details:
 - C# using Microsoft XNA and Java, with PhysX and AI-controlled robots
 - Played using Xbox 360 controllers
 - Up to 6 simultaneous players
- Feature list:
 - Implementation FRC challenge
 - Articulated robots instead of just wheels
 - AI improvements - better individual play and autonomous mode
 - Advanced replay capabilities for strategy analysis
 - Powerful design before building tools
 - Online play
 - Art assets

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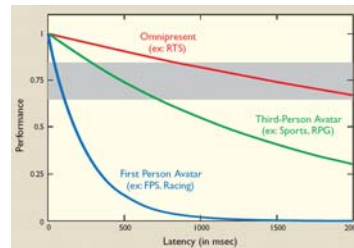
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Latency and Games

- Latency determines how players experience online gameplay
- *Latency compensation* techniques to mitigate latency → how effective?
- **Goal:** Test effects of latency on gameplay
- **Methodology:**
 - build/mod game
 - design game maps
 - run user studies
 - analyze data
- **Students:**
 - 2-3 tech
 - 0-1 art



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Effects of Display Settings on Games

- Computer games have many display options
 - Size, Resolution, Frame rate, Shadows, Textures ...
- Better quality displays may look better, but do they make you *play better*?
 - Established *Frame rate* matters lots, *Resolution* not so much
- **Goal:** Effect of Frame Rate/Resolution on lower gameplay
 - Ex: fundamental user interactions
- **Methodology:**
 - build/mod game based on low-level actions
 - design game maps
 - run user studies
 - analyze data
- **Students:**
 - 2-3 tech
 - 0-1 art



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Better Game Server Selection

- Choosing a "good" server is critical for multiplayer games, but how do you define "good"?
 - Lowest ping? Should use 1 ping or 10 or ...?
- How to pick the best server for you, your friend in California, *and* your friend in Florida?
 - Lowest average ping? Fairest ping? Use ping to handicap?
- **Goal:** Better game server selection
- **Methodology:**
 - Build/Modify custom software to gather ping data
 - Run experiments on real/emulated Internet
 - Incorporate into server browser
- **Students:**
 - 2-3 tech

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Games on Thin Clients

- Have beefy server send game to lesser client
 - Mobile phone, PDA, Sony PSP (remote play)
- Best way to use bandwidth *with low latency?*
- **Goal:** Measure thin client performance for games, propose improvements, implement and evaluate
- **Methodology:**
 - Determine "streaming" game environment
 - Performance evaluation of thin clients (Sony, RDP, X, VNC ...)
 - Run experiments
 - Feedback to drive innovation
- **Students:**
 - 2-3 tech

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Streaming Media in the Home

- Many options to stream media in the home
 - PCs (Orb)
 - Game consoles (Sony PS3, Xbox 360)
 - Slingbox, LocationFree, Apple T.V.
- Much of it now wireless (802.11), which affects performance
 - Loss rate, signal strength, other clients...
 - Determines "best" streaming rate for video
- **Goal:** characterize performance (network and application) for home streaming devices
- **Methodology:**
 - Setup laboratory (hardware, software)
 - Design experimental parameters
 - Measure and analyze data
 - Propose and build better streaming devices
- **Students:**
 - 2-3 tech

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Questions?

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