Mark Claypool's MQP Projects

Network Games
Streaming Media

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

Fire Escape!

- Need real data on how people evacuate
  - Tough to gather safely and realistically
- Goal: Build a multiplayer "game" to model!
- Methodology:
  - Build/mod multiplayer FPS
  - Design levels maps
  - Run user studies (play game!)
  - Analyze data
- Students:
  - 2+ tech
  - 1+ art

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

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 less
- 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

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
  - Gather ping data
  - Run experiments on "Internet"
  - Incorporate into server browser

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
Tube Tracker
- YouTube biggest in the world
  - About 15% of the Internet's global traffic
  - About 10-15% of total traffic in mobile
- Performance of commercial video
  - Largely unknown - "Black Box"
  - Important - design better infrastructure, Internet
- Build tool and run experiments!
  - Done a Media Tracker and Real Tracker, now TubeTracker!
- Methodology:
  - Understand YouTube API, Javascript
  - Write Javascript app to control YouTube flash (swf)
  - Run experiments to evaluate performance

Streaming Media in the Home
- Many options to stream media in the home
  - PCs (Orb)
  - Game consoles (Sony PS3, Xbox 360)
  - Slingbox, LocationFree, Apple TV
- 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

Games With A Purpose (GWAP)
- Playing games is fun, but can provide useful information
  - See http://www.gwap.com/
- Here, we want game playing to tell us about network performance
- Creative game design, instrument to gather network data
- Methodology:
  - Design games
  - Build or instrument
  - Run experiments
  - Analyze data

Questions?
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