Mark Claypool's MQP Projects

Silicon Valley Project Center
- C-term (winter in California!)
- Housing costs covered
- Sponsored projects

Latency and Games
- Latency affects how players experience online gameplay
- Latency compensation techniques to mitigate latency → how effective?
- Goal: Test effects of latency on gameplay and visual
- Methodology:
  - build/mod game
  - design game maps
  - run user studies
  - analyze data

Games on Thin Clients
- Server streams game to lightweight ("thin") client
  - Mobile phone, PDA, Sony PSP (remote play)
  - OnLive, Gaikai (Sony PS4)
- What is the network turbulence? 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 (Grid, Sony, RDP, X, VNC ...)
  - Run experiments
  - Feedback to drive innovation

Twitch TV
- Traditional video on demand (e.g., YouTube) – pre-recorded, on server, with camera
- New phenomena is game video (e.g., Twitch) – live, on clients, screen capture of game
- Differences? Encoding, length, compression ...
- Build tool and run experiments!
  - Done a Media Tracker and Real Tracker, now TwitchTracker
- Methodology:
  - Understand twitch player/site
  - Write app to crawl and analyze content
  - Run experiments to evaluate performance

League Crawling
- League of Legends popular MOBA game
- Matchmaking challenge
  - Skill (ELO), team comp
- Effects of latency on game
- Effects of team-champ on game
- Difference in Regions/servers
- Methodology
  - Previous work built crawler
  - Examine data set → new results
  - (Re-)build crawler → new data
HTTP Streaming Tracker

- Video streaming is becoming HTTP streaming
  - YouTube over HTTP (~15% of the Internet’s global traffic)
  - Apple HTTP Live Streaming (HLS)
  - Microsoft Silverlight Smooth Streaming
- Performance of commercial HTTP streaming video?
  - Largely unknown, but important to design better networks
- Build tool and run experiments!
  - Done a Media Tracker and Real Tracker, now HTTP Streaming Tracker

Methodology:
- Understand media players (e.g., YouTube API, Javascript)
- Write wrapper to control/instrument application
- Run experiments to evaluate performance

Mobile Network Measurements

- New networks deployed promising greatness versus
- Actual performance largely marketing
- What does computer science say about performance?

Goal: Measure performance for existing 4G network through experiments

Methodology:
- Setup end host (network card)
- Develop measurement software (e.g., bandwidth estimation)
- Design experiments (location, parameters)
- Run and analyze

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Video Buffer Sizing

- Client side buffer critical for streaming video
  - Avoid dreaded “rebuffering”
- But how is buffer size chosen?
  - Unknown! But evidence suggests poor (e.g., fixed size)
- We have: method to determine optimal buffer size
  - Includes heuristic to approximate optimal
- Goal: Measure existing buffering, compare to optimal

Methodology:
- Setup testbed
- Design and Run experiments
- Analyze data

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Questions?

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