QUINCE: A gamified crowdsourcing QoE assessment framework

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Common Challenges in measuring QoE

- Subjects
- Reliable subjects
- Persistently contributing reliable subjects
Source of Subjects

• Students
• Crowdsourcing platforms
  • Amazon Mechanical Turk
  • Many other crowdsourcing platforms
• They are not prefect
Motivation

• Monetary
  • Extrinsic
    • Strong, but not long lasting
    • Maximize hourly wage

• “Spin” → Measurement Task
• Grape → Money
Motivation

• Non-monetary
  • A sticker (Spoofe...
QUINCE

• Web-based crowdsourced measurement platform
  • Topology
  • Performance
  • Video QoE
  • ... other measurement tasks need human input/intervention

• Apply *gamification* techniques to improve the QoE of measurement tasks
  • Enhance user engagement
  • Transform motivation from monetary to non-monetary
Gamification

• The use of game design elements in non-game contexts [Deterding11]
• SAPS framework [Zichermann11]
  • Status, Access, Power, Stuff
• Measurement-as-a-game

The game

• Each participant has a mission to help us to fix the Internet!
  • Sense of mission
  • Feel heroic

• The fact
  • Performing traceroute
  • Speedtest
  • Video QoE measurement
Map-based interface

• Internet paths are shown on a US map
  • The paths are drawn with historical traceroute data from Ark and IP geolocation databases.
  • Red dots are the location of the inferred congested link
  • Users are instructed to click on the red dots and help diagnosis the “paths”
One-time measurement
Why these measurements?

• **Traceroute**
  • Cannot be done from the browser (even from a plugin)
  • Gather topology information to correlate with performance data

• **Speedtest using fast.com servers**
  • Needs participant to download CDN assignment information which cannot be obtained in the background because of same-origin policy

• **QoE assessments**
  • need human eyes
Train the subjects

• An interactive tutorial is used to
  • Good onboarding experience
  • Educate and ensure the subject knows how to conduct the measurement, and provide the correct result
  • Even CS undergrad students *never* conduct a traceroute!

• Task design
  • Lower the barrier of conducting network measurements
  • Reduce the chance of going wrong
Upcoming

• More game elements
  • Increase the fun level
  • Scores, badges
  • Connect to social network

• More types of measurements
  • Require some human effort (no need to install software)
    • Ping for IP geolocation
  • Video streaming QoE to different streaming providers
  • Other application QoE
  • ...
Help wanted

• Share measurement infrastructures
  • Speedtest servers
  • Video streaming servers

• Collaboration
  • Your measurement can be one of the “tool”!

• Try and give us feedback

http://crowdtrace.caida.org