

QUINCE: A gamified crowdsourcing QoE assessment framework

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Common Challenges in measuring QoE

- Subjects
- Reliable subjects
- Persistently contributing reliable subjects



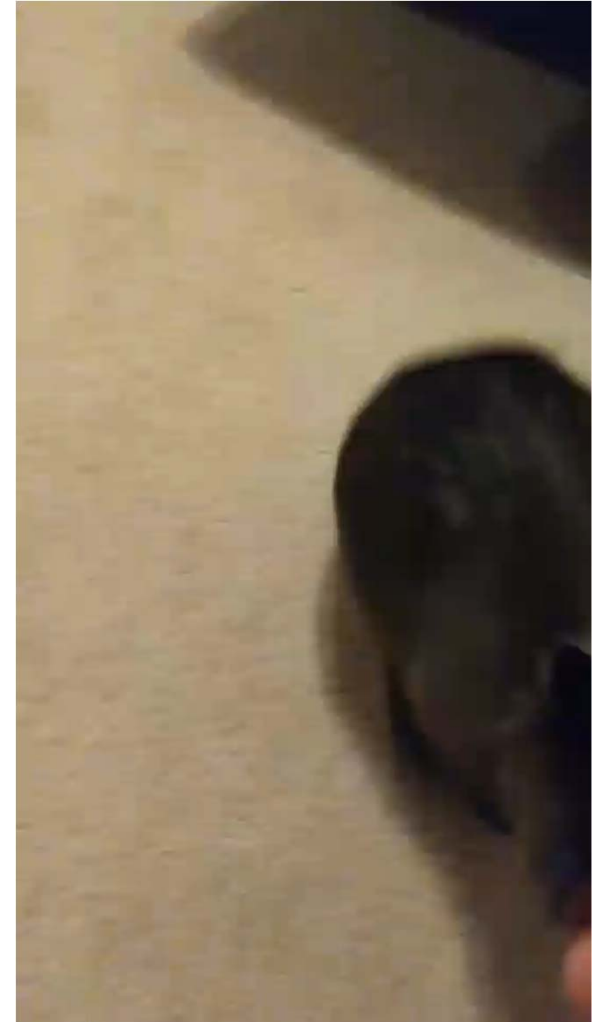
Source of Subjects

- 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 (Spoofer sticker!)
 - Fun/ Entertainment
 - Commitment
 - Social influence
 - Use the Firefox
- Intrinsic, long lasting



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

[Deterding11] S. Deterding et al, Gamification: Toward a definition, Proc. CHI Gamification Workshop 2011

[Zichermann11] Gabe Zichermann, Christopher Cunningham, Gamification by Design: Implementing Game Mechanics in Web and Mobile Apps, 2011

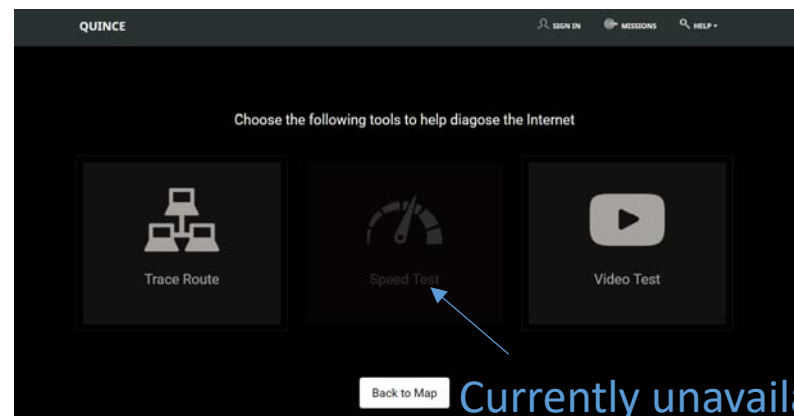
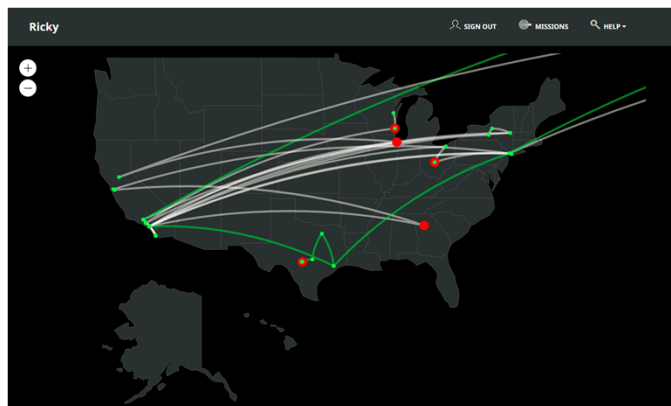
The game

- 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

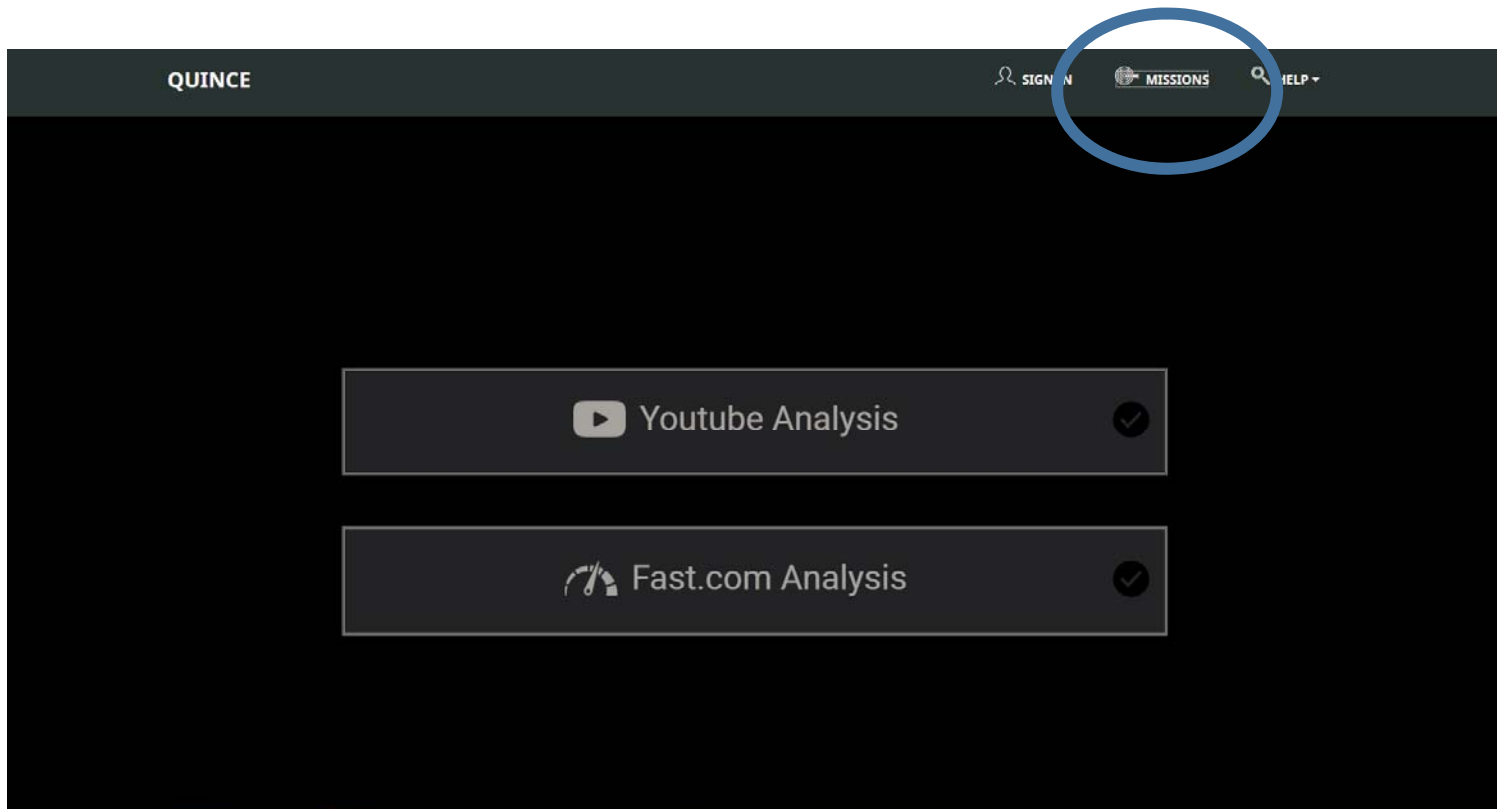


Map-based interface

- 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>

