Hack Like the Movie Stars: A Big-Screen Multi-Touch Network Monitor

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Overview

• Multi-touch interfaces
  – What is multi-touch?
    • This rhetorical question will not be dignified with a response.
  – Optical multi-touch methods

• Our big board
  – History, building process
  – Other uses

• The tool: DVNE
  – Architecture
  – Future plans
Multi-touch Methods

• **Electronic**
  – Capacitive (iPhone)
  – Hard to build at home

• **Optical**
  – Main idea: capture infrared blobs with a camera
• The question: how to illuminate the touches?
• Rear Diffused Illumination
  – Example: Microsoft Surface
  – IR shines out of the screen, illuminating objects
Optical Multi-touch

- **Frustrated Total Internal Reflection**
  - Shine light into the edges of plexiglass
  - Touching the glass causes it to flex and emit light
  - This is what we use
Our big screen

• AKA That Thing I Keep Tripping Over
  – FTIR method
  – 56” diagonal, 16:9 aspect ratio (roughly 48”x30”)
  – 1280 x 800
  – Plexiglass construction
  – Laminated vellum projection screen
  – 168 IR LEDs
  – PlayStation Eye camera
• Touch signals over UDP
  – TUIO Protocol
What do we DO with it?

• Some ongoing projects
  – Immersive collaboration (multi-touch caves)
  – Educational software (we're building tables for schools)

• But we're a security lab
  – We also like campy movies. ("It's a UNIX system!")
We also play games ...
• Dynamic Visualization for Network Environments
  – Primary goal: to build a flashy Hollywood-style computer interface
  – Secondary goal: build something useful for looking at networks

• Network monitor
  – Track TCP streams, identify protocol using signatures

• Interface
  – Python with pymt multitouch extensions
  – TUIO
Resources

- **Natural User Interface Group**
  - [http://www.nuigroup.com](http://www.nuigroup.com)

- **PyMT**
  - [http://pymt.txzone.net](http://pymt.txzone.net)

- **Pyglet**
  - [http://www.pyglet.org](http://www.pyglet.org)
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