

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

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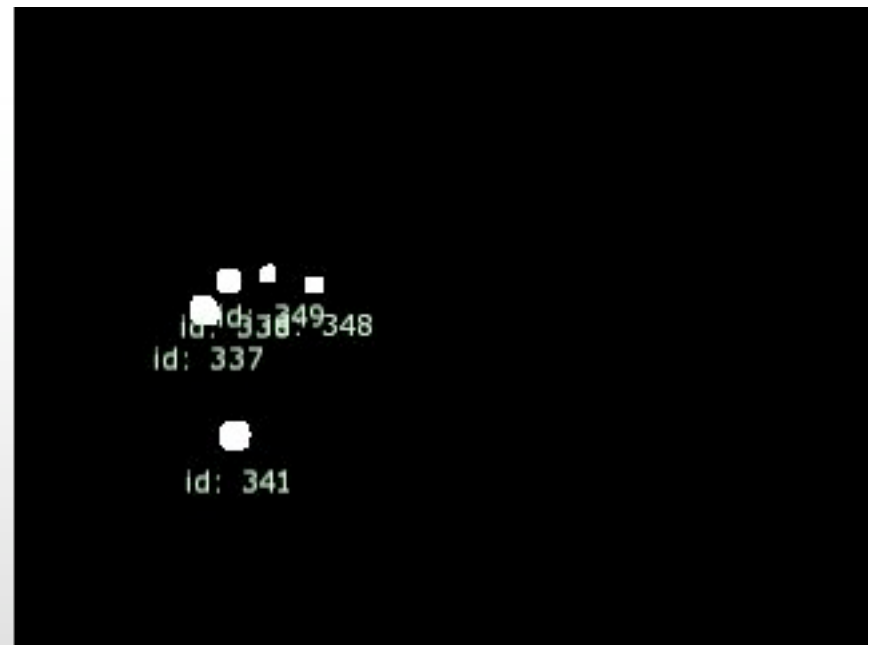
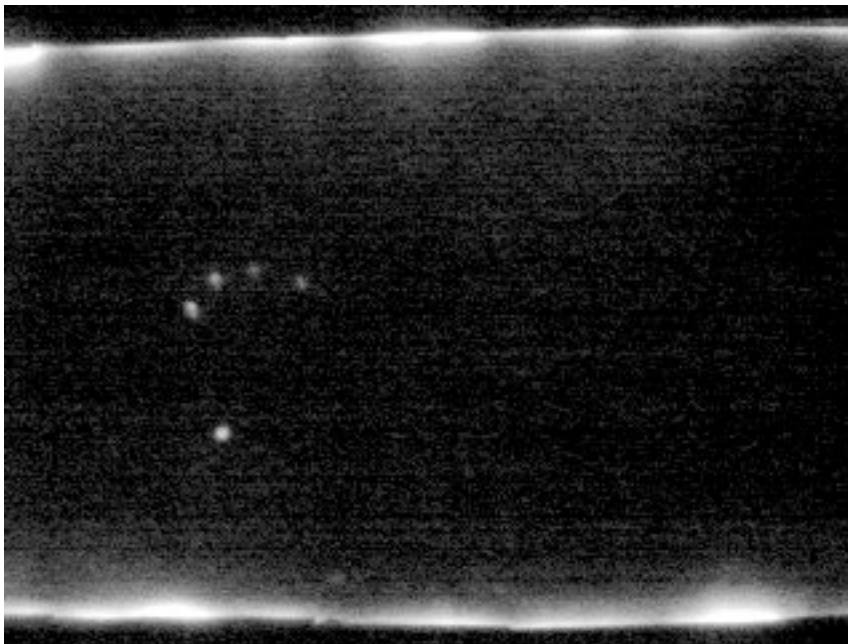
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# Overview

- **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

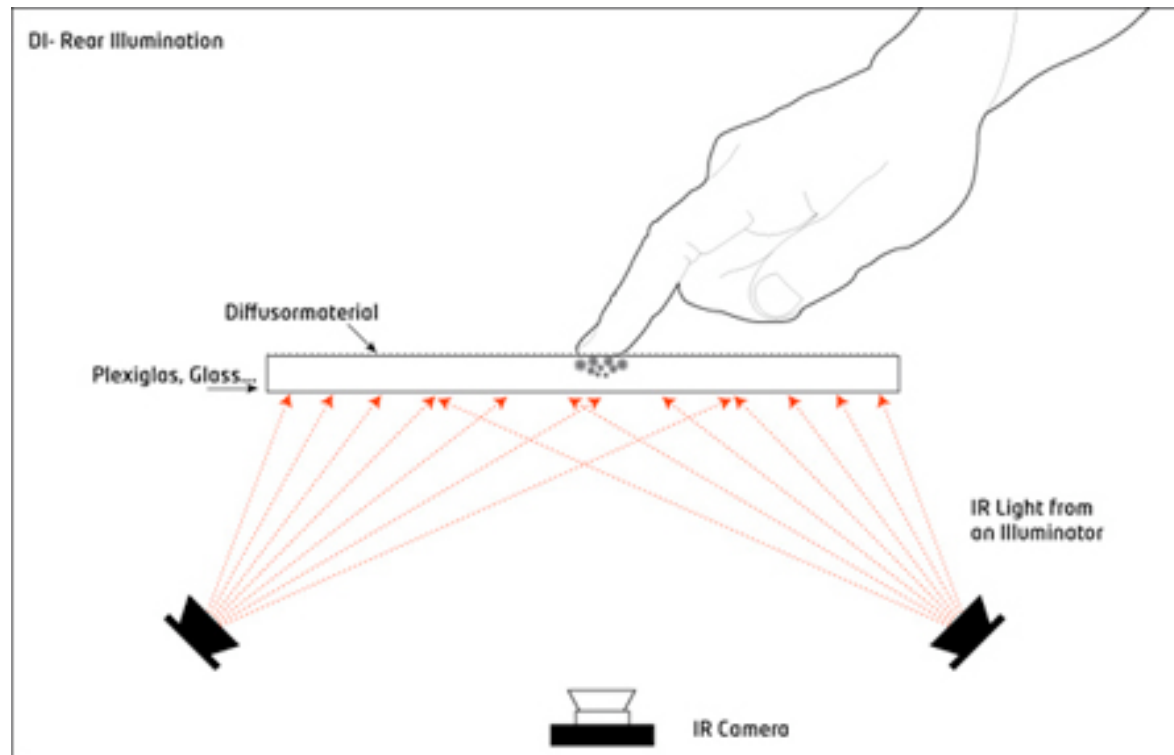
# Multi-touch Methods

- Electronic
  - Capacitive (iPhone)
  - Hard to build at home
- Optical
  - Main idea: capture infrared blobs with a camera



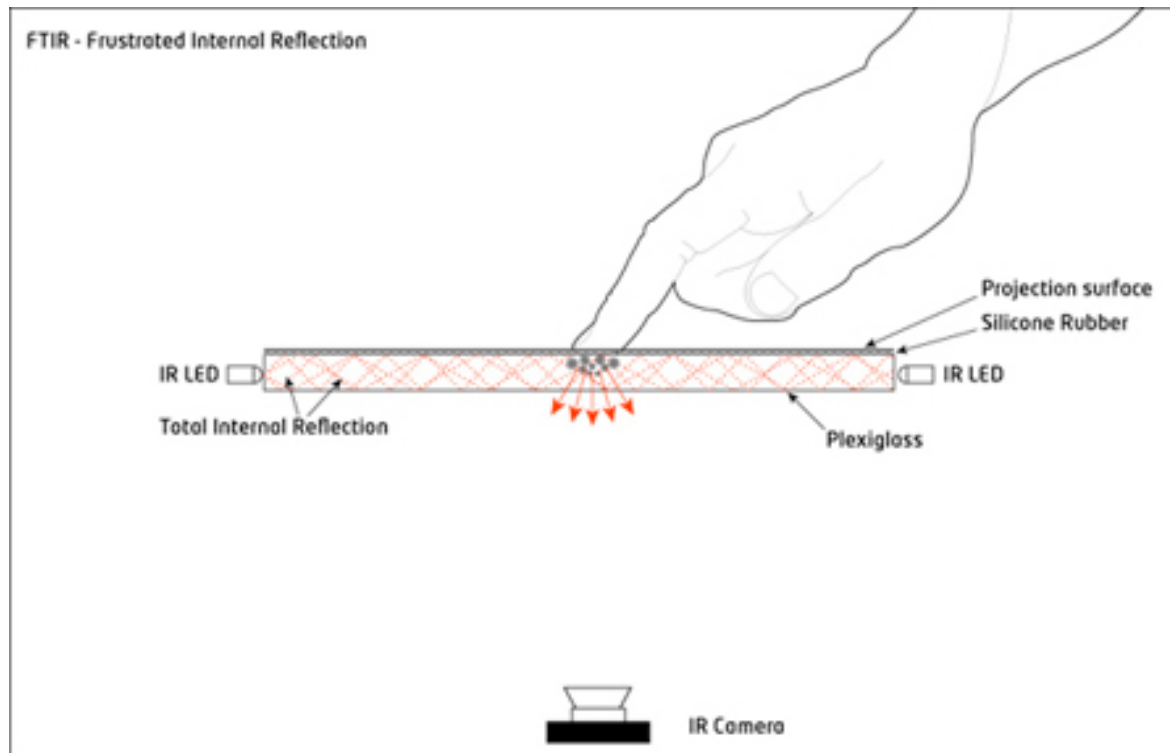
# Optical Multi-touch

- 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



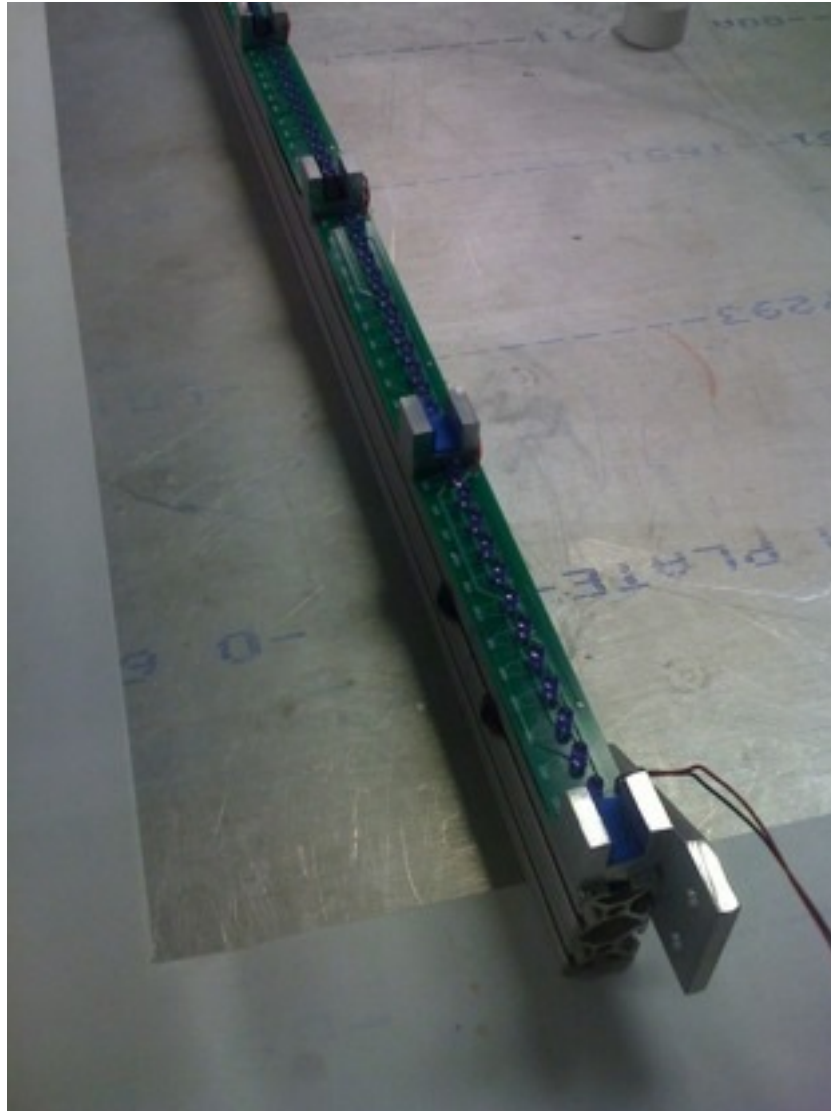


# Our big screen

- 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

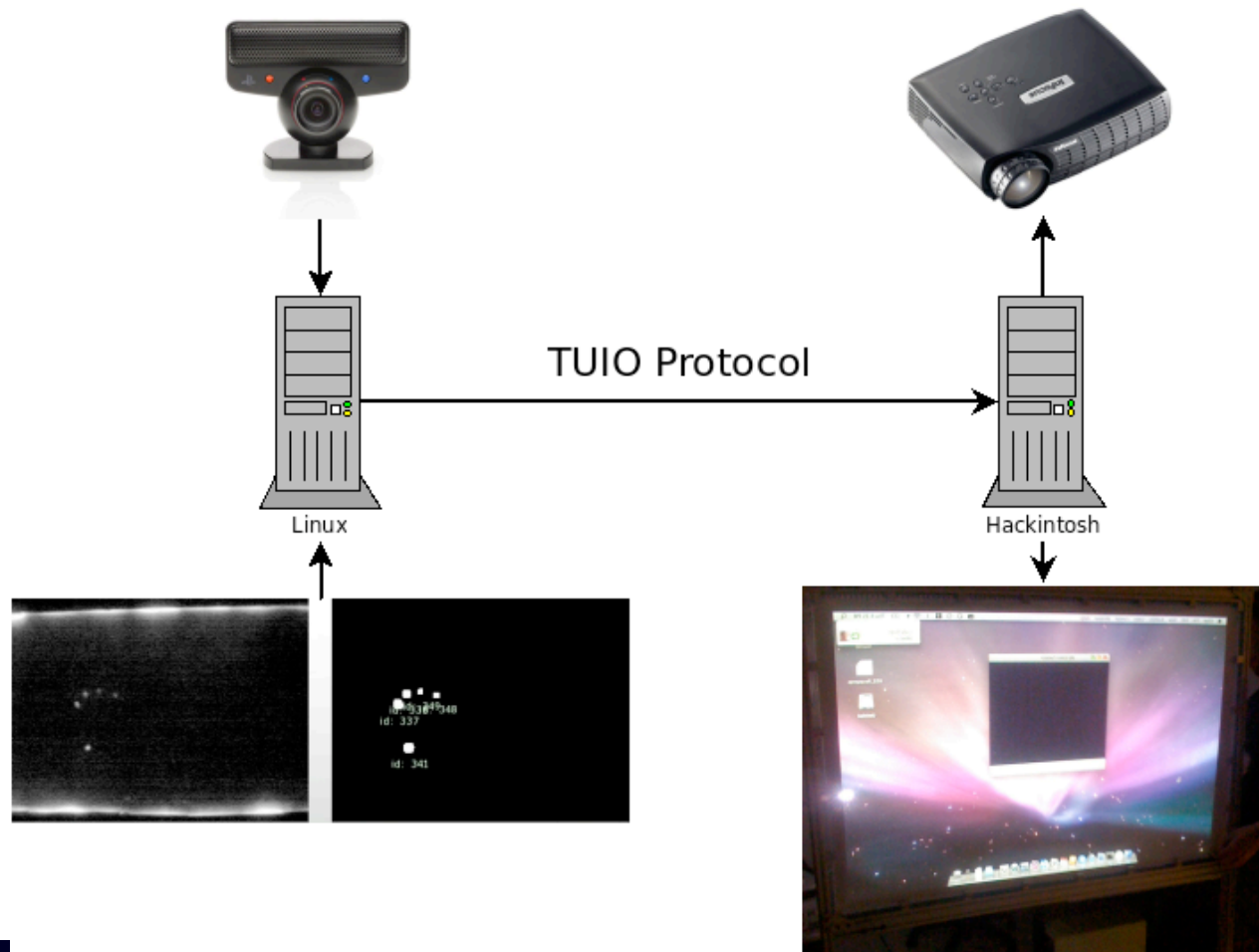


# Our big screen



# Architecture

- Touch signals over UDP
  - TUIO Protocol



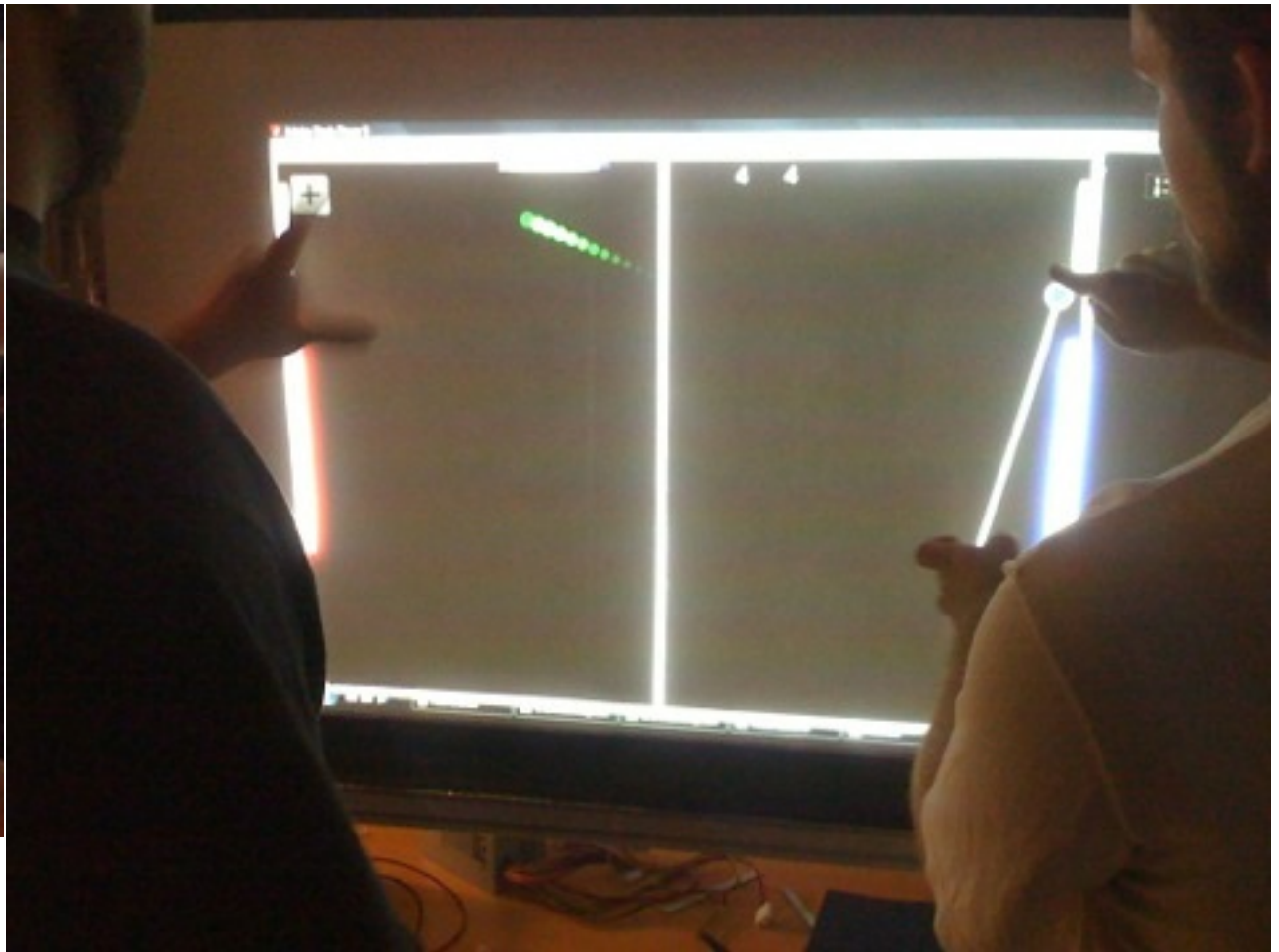
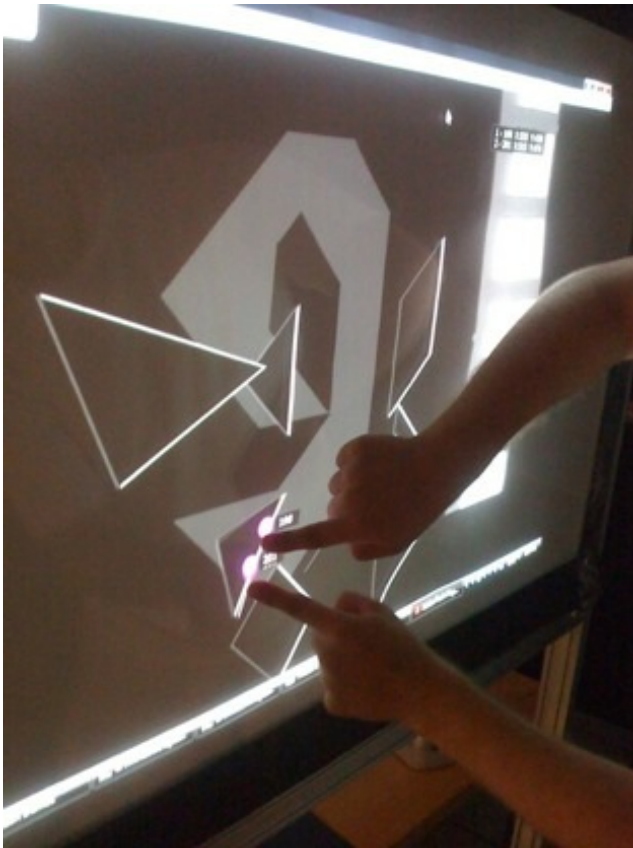


# What do we DO with it?

- 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 ...



# DVNE

- **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 pynt multitouch extensions
  - TUIO

# Resources

- Natural User Interface Group
  - <http://www.nuigroup.com>
- PyMT
  - <http://pymt.txzone.net>
- Pyglet
  - <http://www.pyglet.org>



# Acknowledgements

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