Dual Reality

The Convergence of Virtual Worlds and Sensor Networks

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Things That Think Consortium Meeting
Dinner Break Out Session
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Barstool Anthropology

What characterizes us as human?

~~thumbs~~

~~bipedalism~~

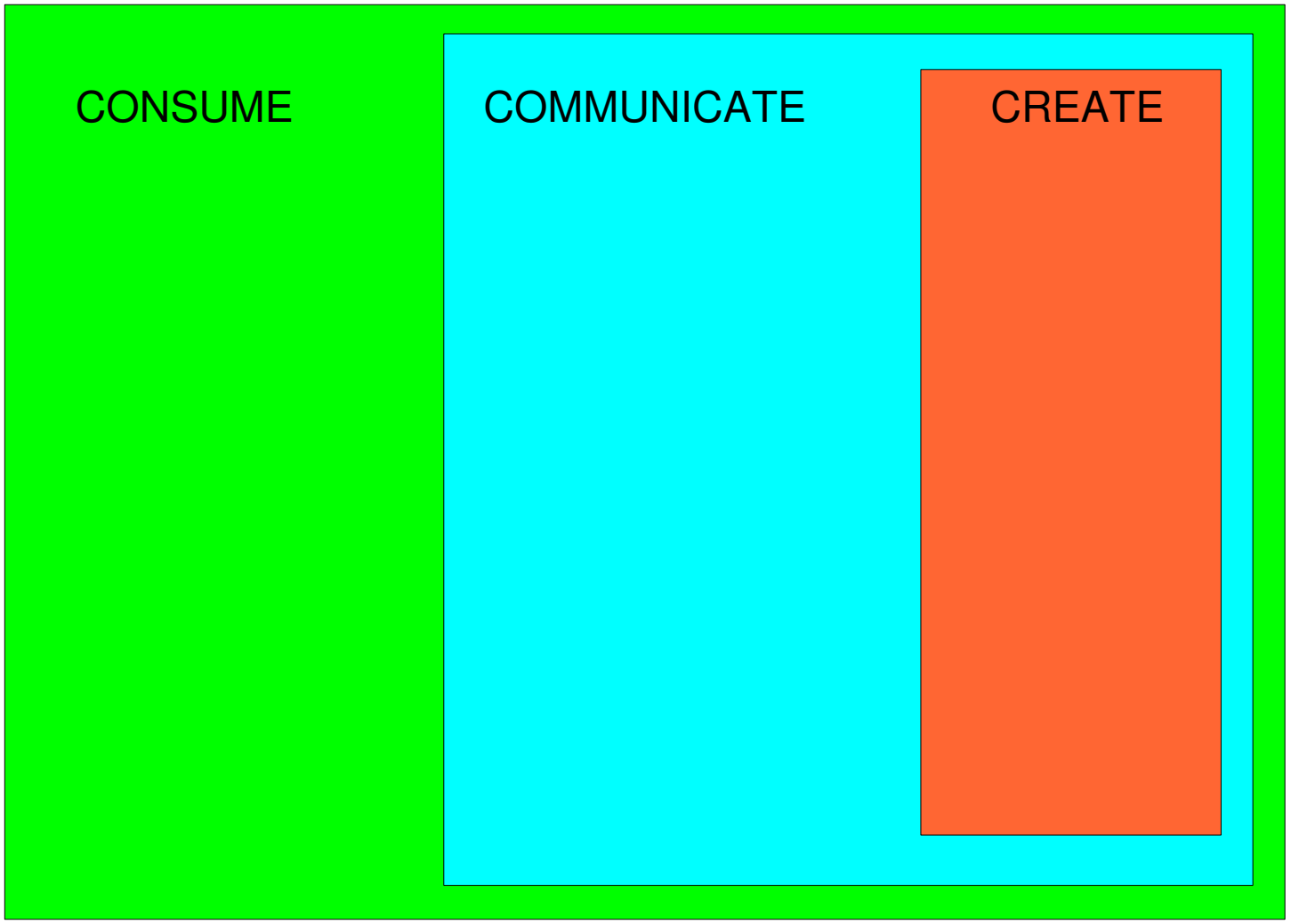
~~big brains~~

language

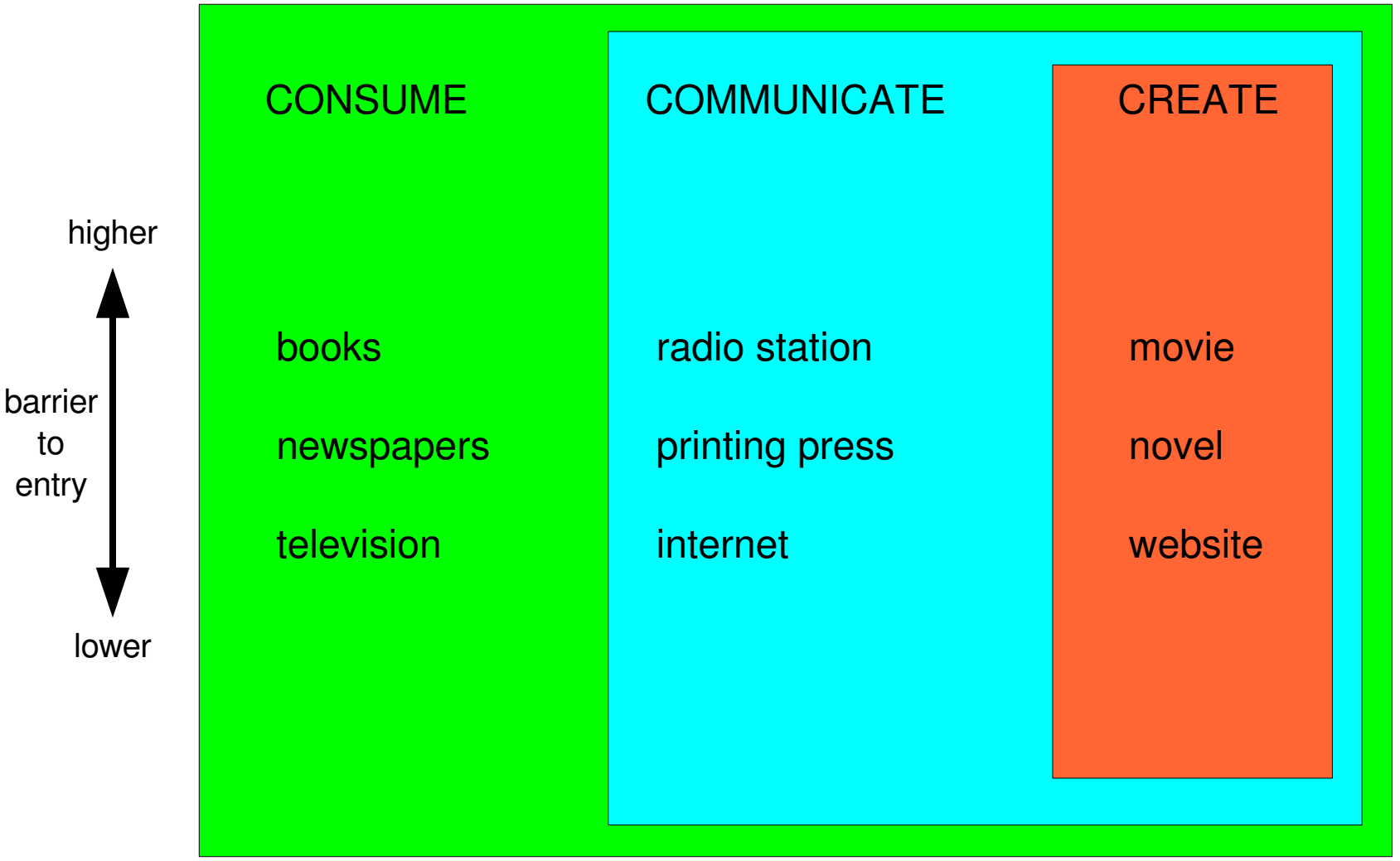
written language?

media ✓

Relations to Media



Relations to Media



What's Next?

CONSUMPTION made easy by broadcast television

COMMUNICATION made easy by the Internet

CREATION made easy by ?????

The answer comes in two parts.

Sensor Networks

the dream:

- small
- ubiquitous
- cheap
- wireless
- invisible
- robust

the reality:

- expensive
- unreliable
- research only
- obtrusive
- unmaintainable
- no killer app
- privacy concerns

Virtual Worlds

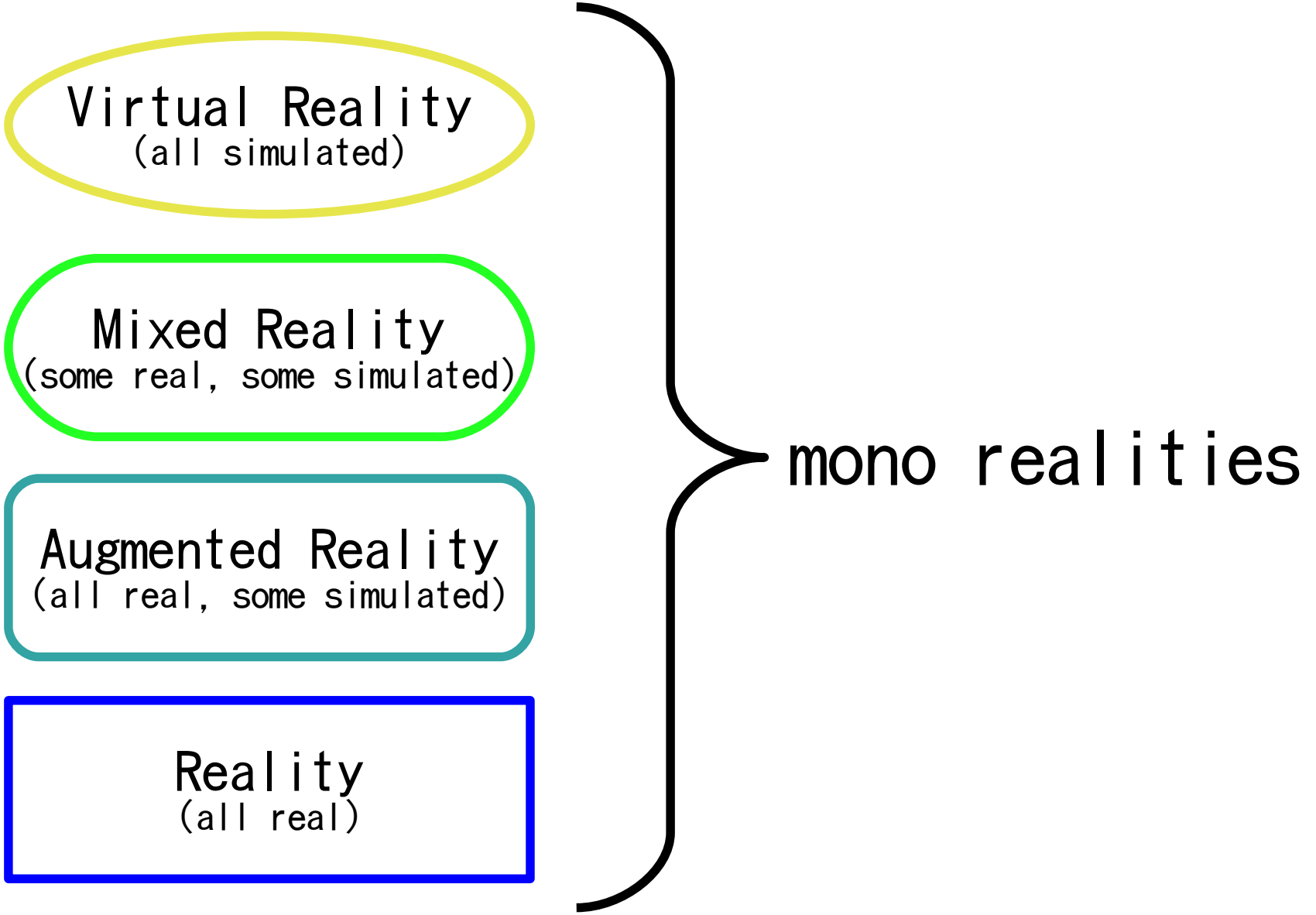
Many attempts, many failures

Potential to be as revolutionary as the WWW

Example: Second Life by Linden Lab

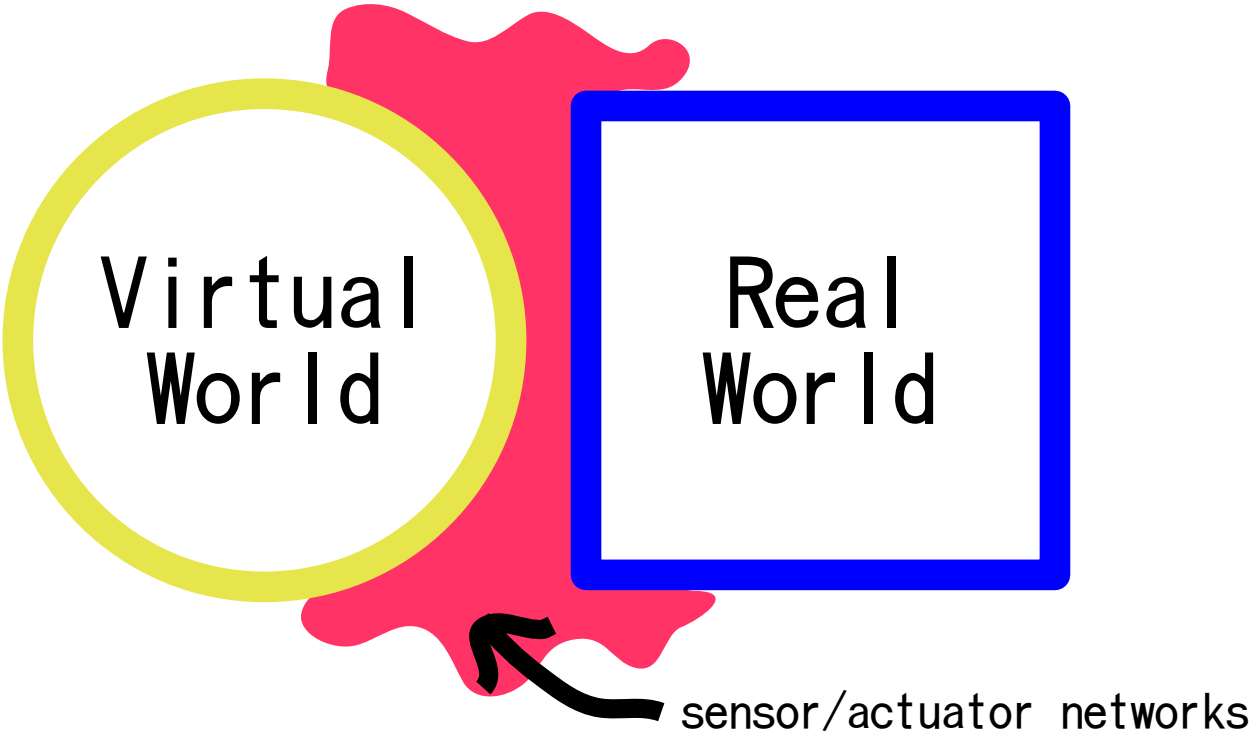
Key attributes:
- shared immersive experience
- persistent state
- market economy
- creative medium

Taxonomy of Reality

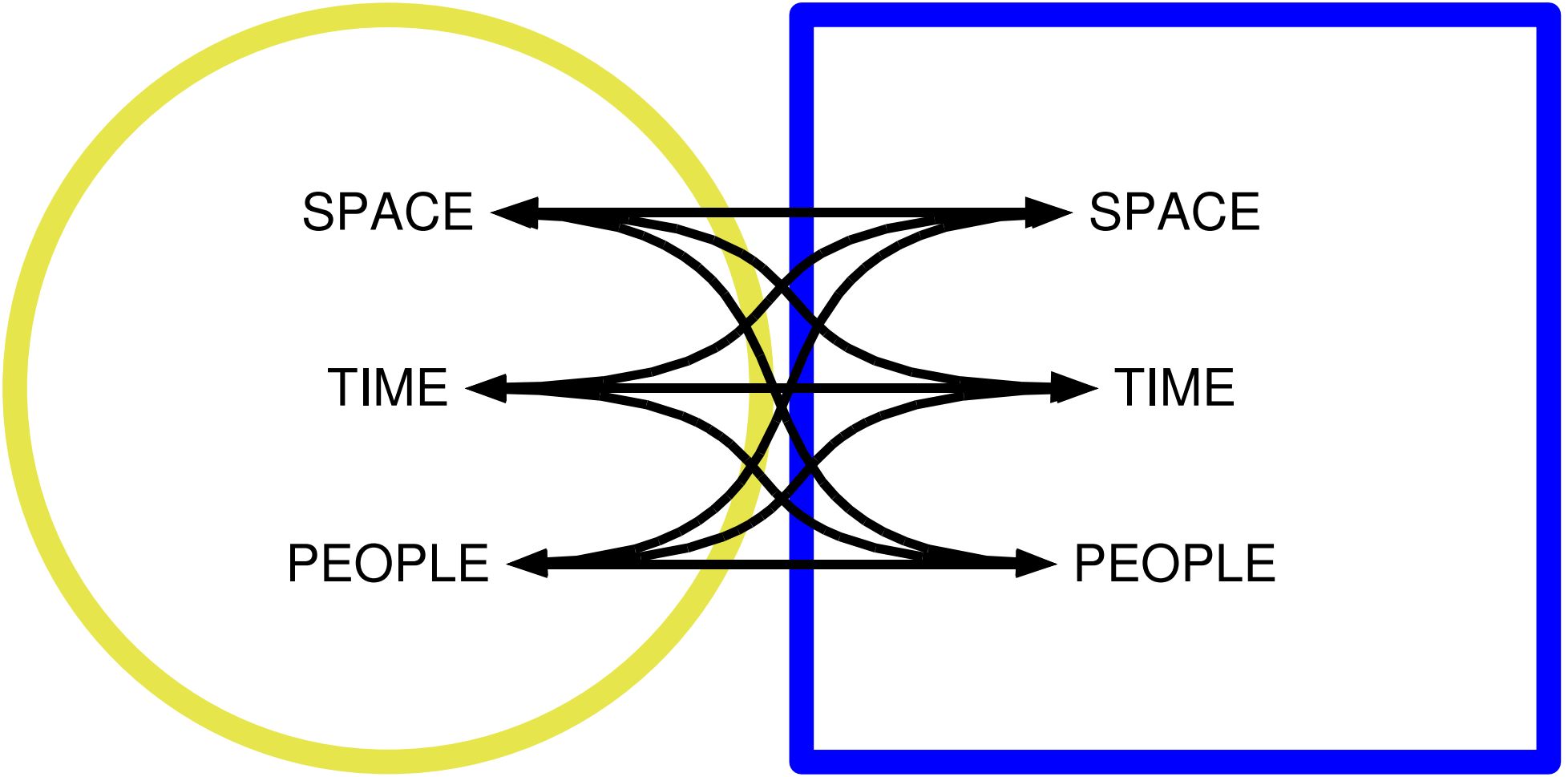


Dual Reality

Two complete realities that can influence and leak into each other by means of ubiquitous sensor/actuator networks.

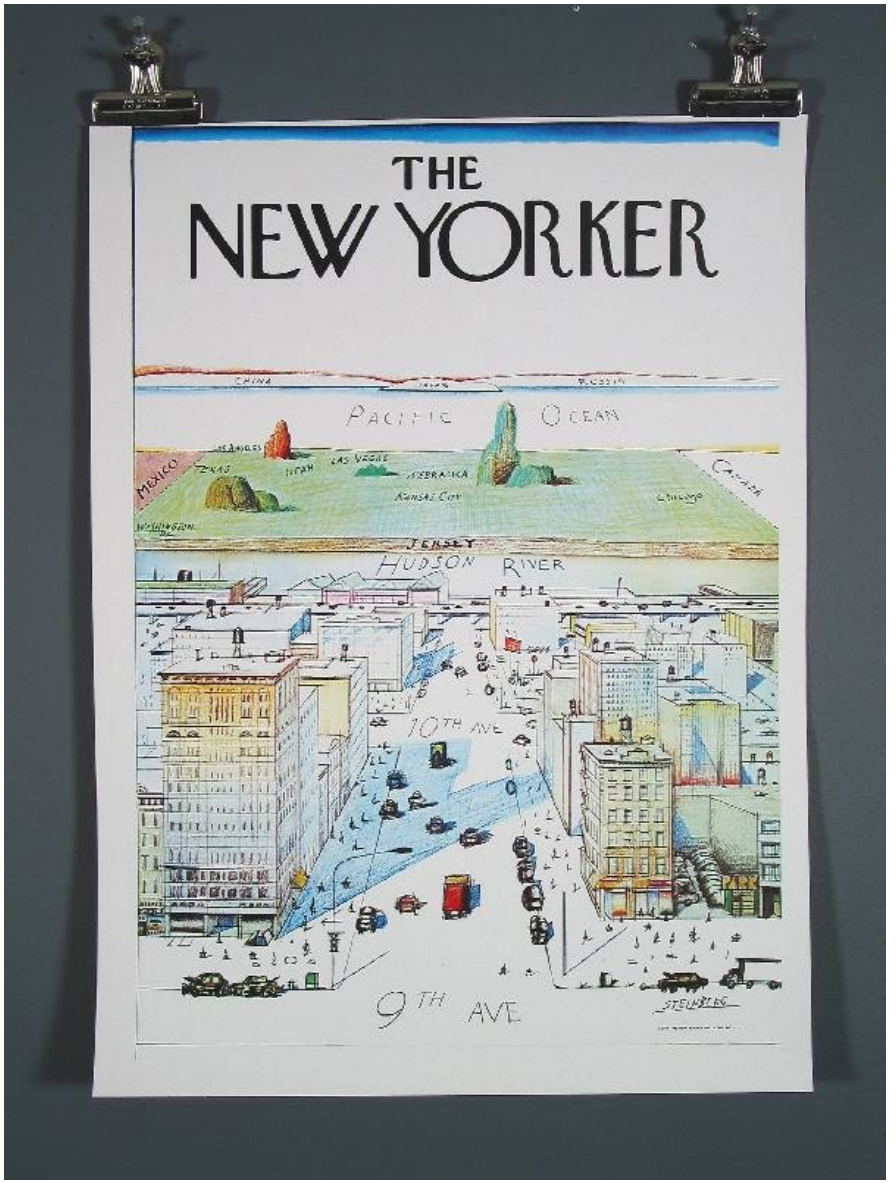


Representation

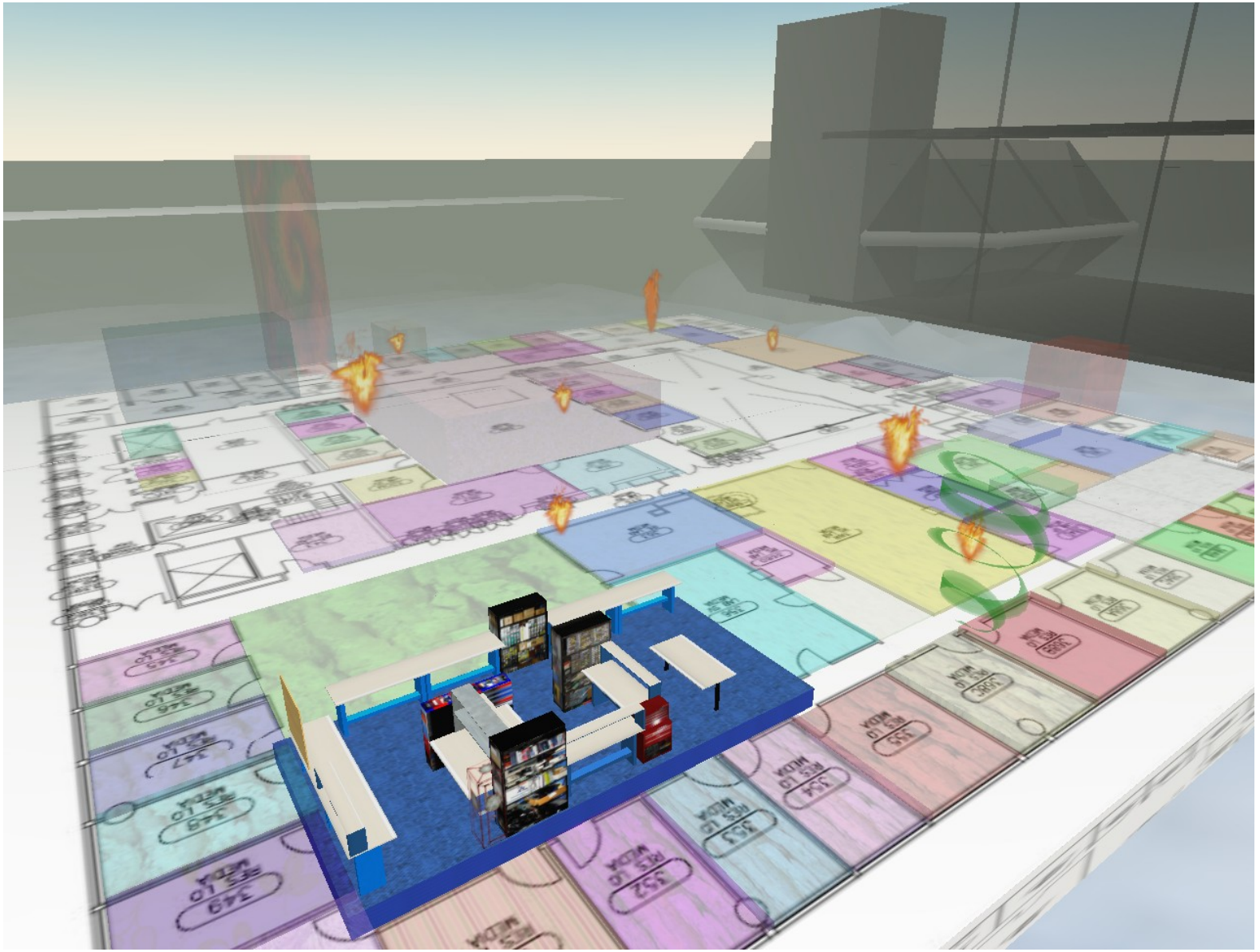


Perception = Reality Distortion

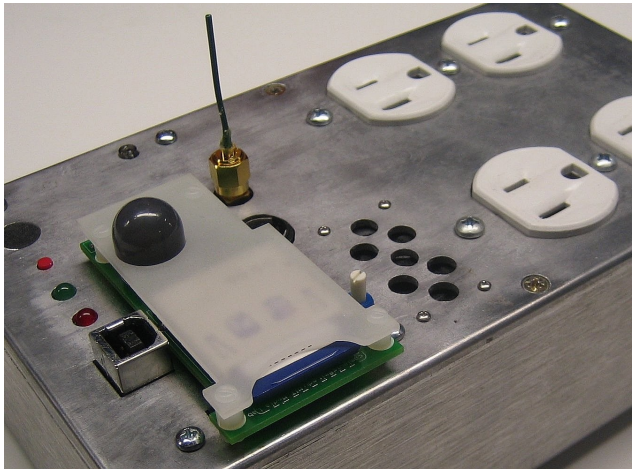
Dual Reality accommodates distorted versions of reality as well as the actual version.

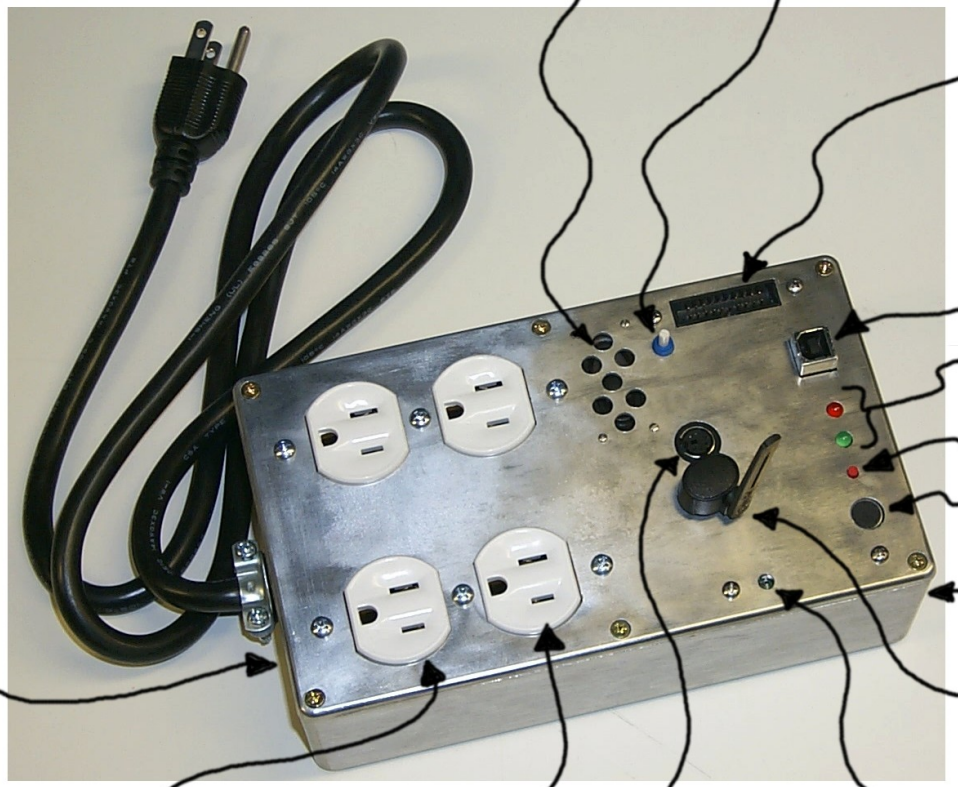


Dual Reality Lab



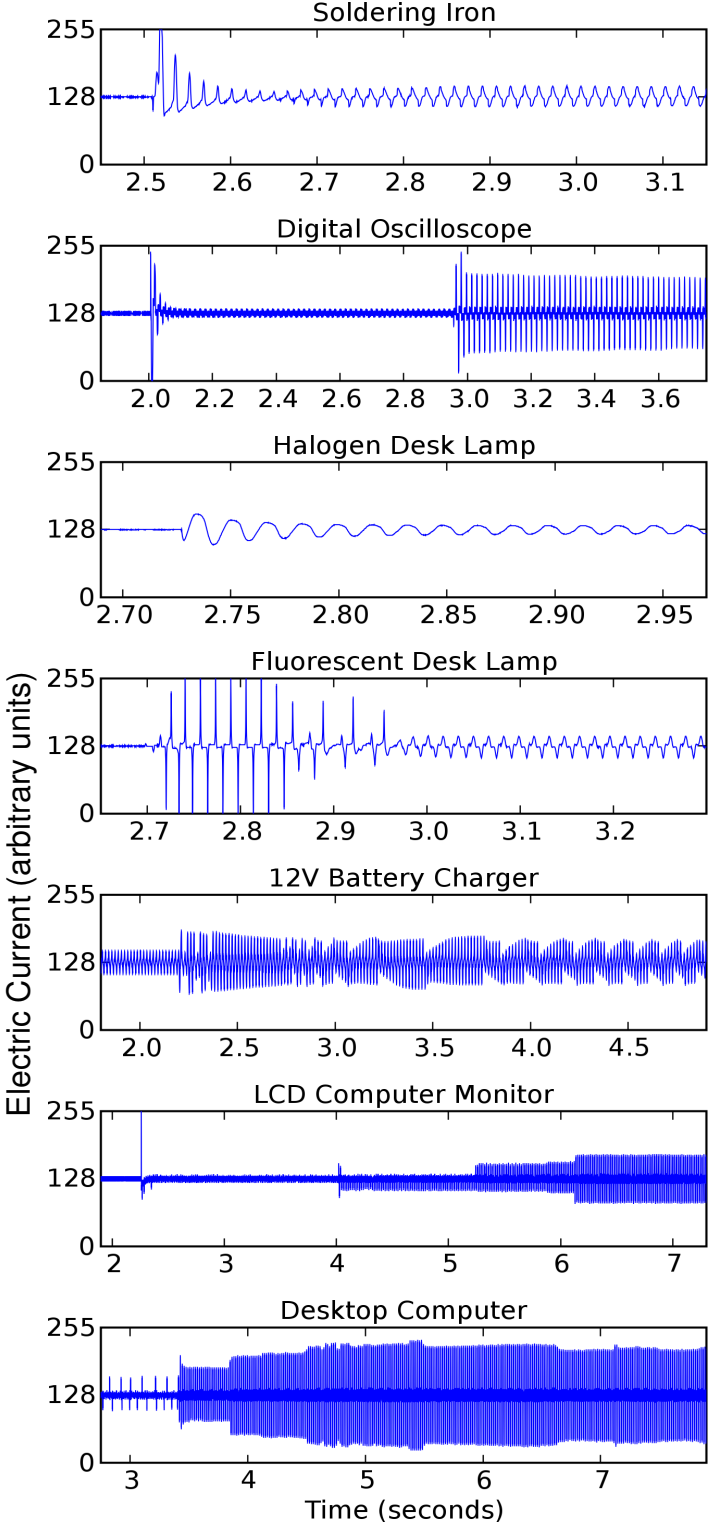
Plug Sensor Network



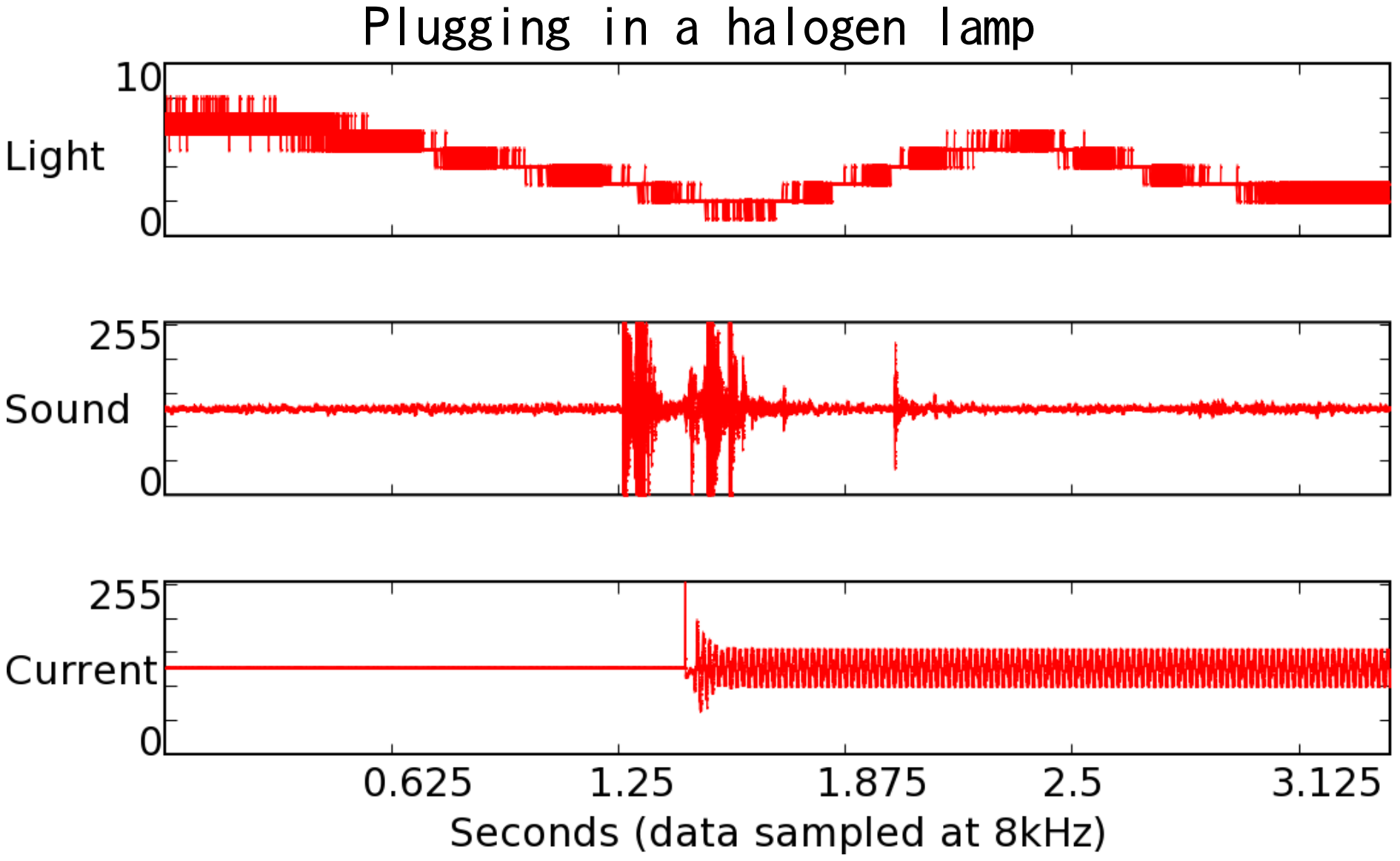


Why a Power Strip?

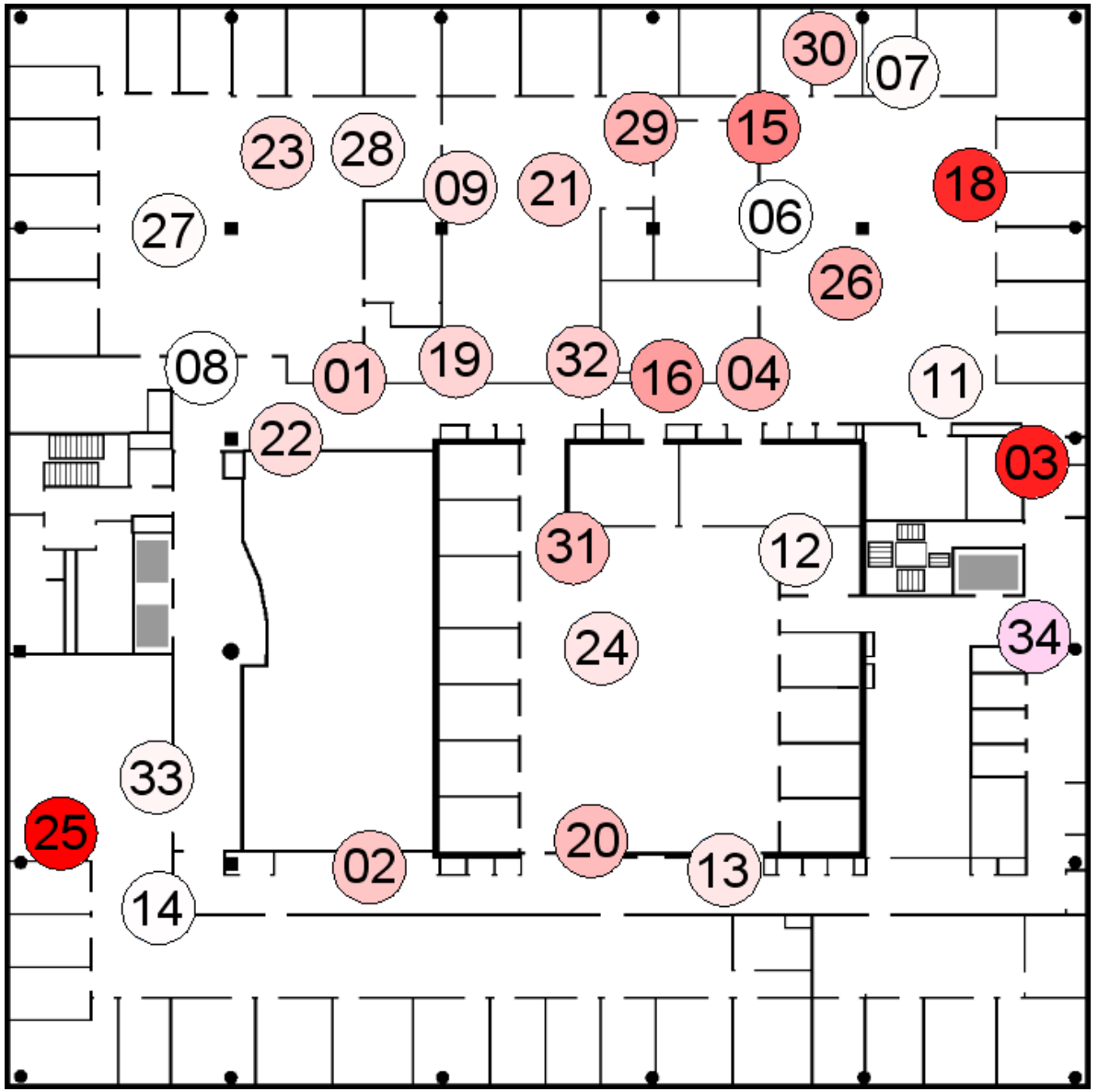
- always plugged in; no batteries to change
- familiar and ubiquitous
- well defined, yet broad usage scenario
- lots of interesting data
- perfect as a network backbone for other nodes

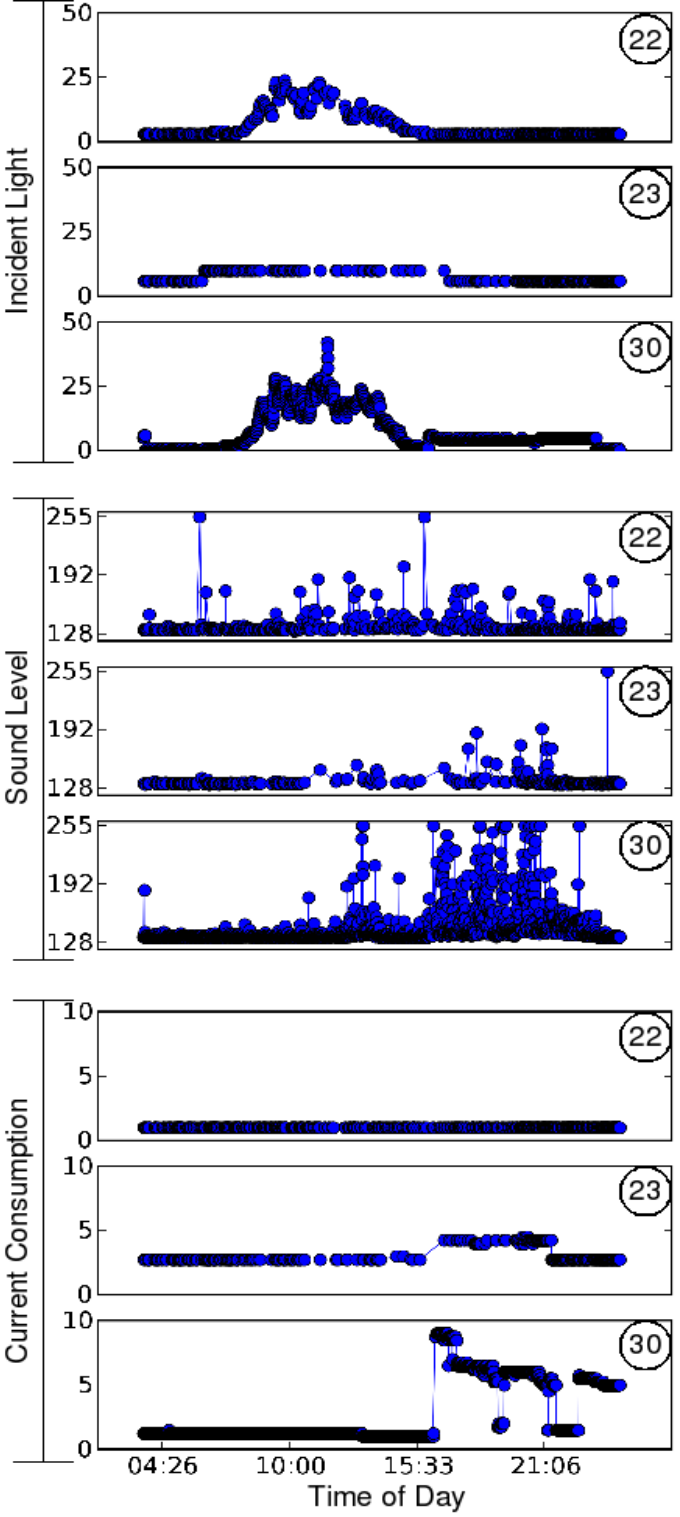


Multimodal Sensing



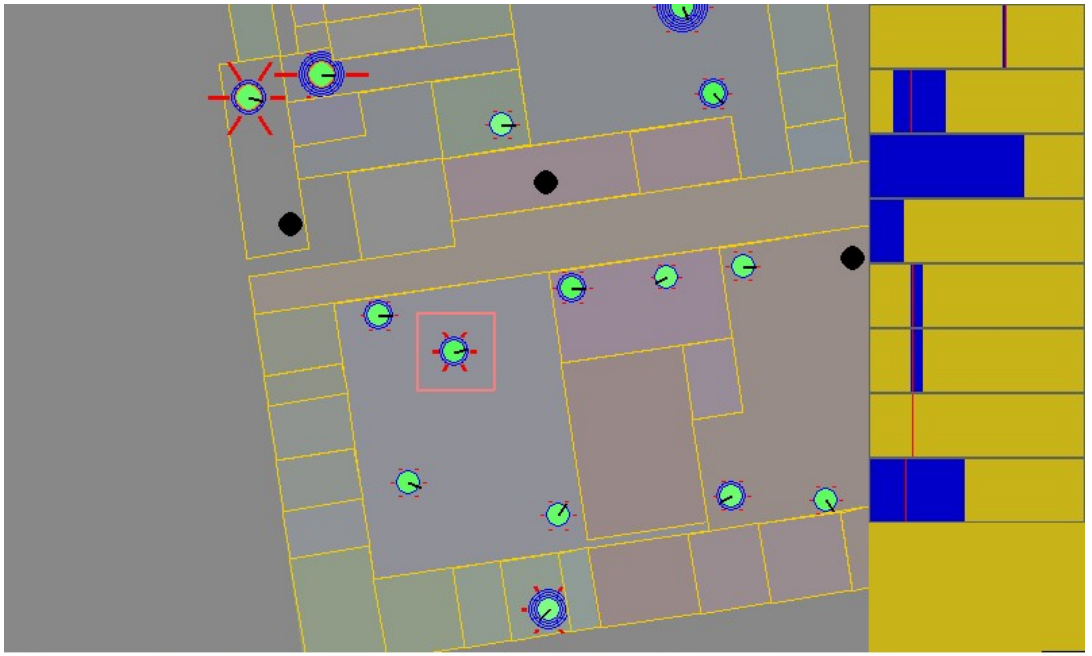
Rhythm of a Building





In Situ Sensor Network Browsing

- Inspired by *Star Trek*'s Tricorder
- 3D compass for orientation
- Wifi, Bluetooth, Plug radio, touchscreen
- Live updates from Plugs with ability to zoom in and out
- Point-and-browse



Example Applications

- telepresence
  - intentional: in-world teleconference
  - ambient: distributed water cooler
- avatar body language
- sensor movies and narrative generation
- alumni tours of campus as they remember it

What's Next?

CONSUMPTION made easy by broadcast television

COMMUNICATION made easy by the Internet

CREATION made easy by virtual worlds & sensor nets

Convergence

Sensor networks expand our senses
across both time and space.

Virtual worlds are a forum in which
to use these new senses.

If virtual worlds are the canvas, then
sensor networks are the pallette.