Before we get started ...

pass the around the attendance sheet *boustrophedontically* "like an ox plowing a field"

back-and-forth

back-and-forth

locating today's talk ...

- HCI & CS
  - "The interface is the application."

- CS & Engineering
  - "We're all software engineers."

Creative
Computing
or
the Art of Innovation

Steve Harrison

SHarrison@cs.vt.edu

Art, Design, & Science, **Engineering**

Steve Harrison

SHarrison@cs.vt.edu

Where does *innovation* come from?

Steve Harrison

The 4 creative disciplines:

art	**science**
design	**engineering**

from Rich Gold's *The Plenitude*

Steve Harrison

The 4 creative disciplines:

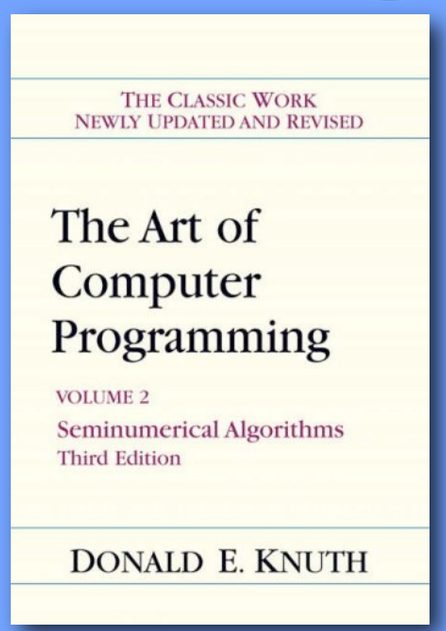
art	**science**
design	**engineering**

Steve Harrison

Goals, values, methods, aesthetics, personalities, language, norms

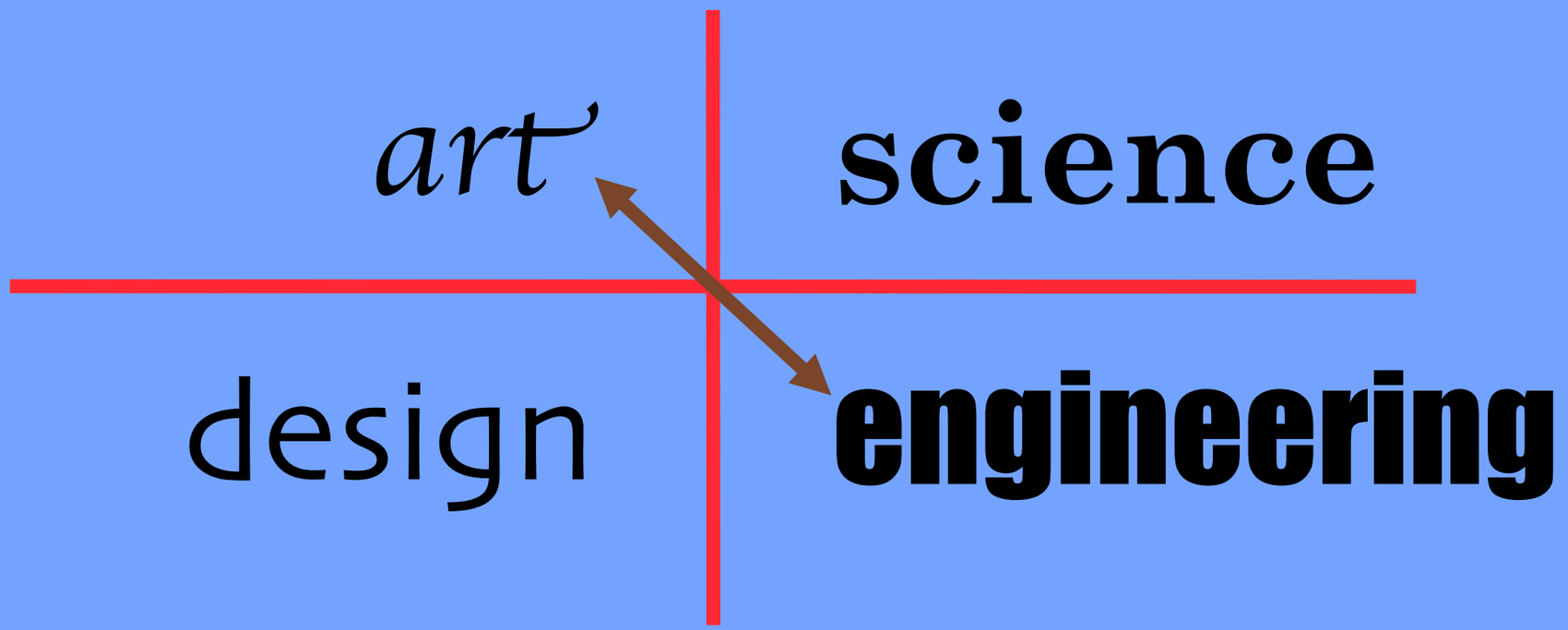
art | **science**

design | **engineering**



Steve Harrison

Goals, values, methods, aesthetics, personalities, language, norms



How to collaborate across these axes?

Steve Harrison

What forms of collaborations work? What sorts of results do these forms deliver? What sorts of knowledge are created?

Steve Harrison

Some forms of cross-disciplinary work

Support
Inspire
“Riff” and co-produce
Blurring the boundaries

Steve Harrison

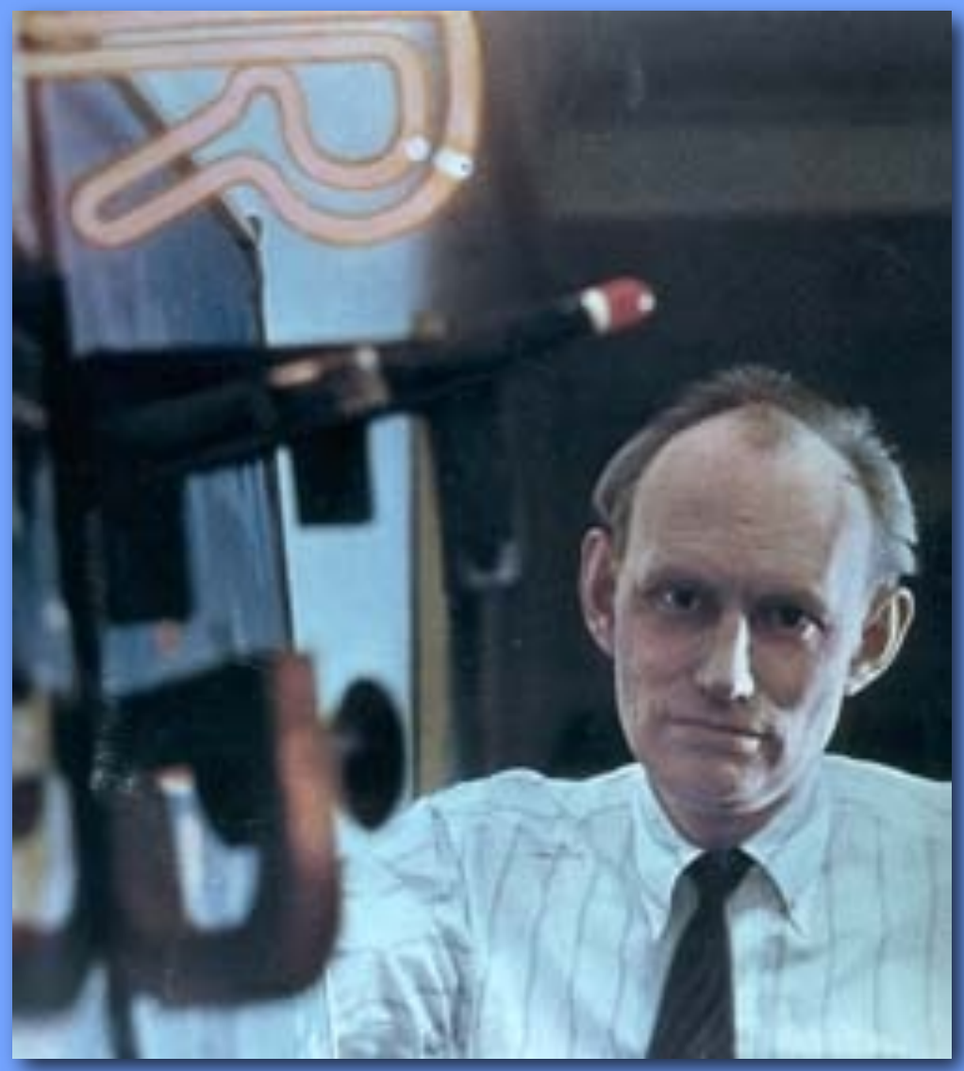
Engineers supporting artists

Steve Harrison

Engineers supporting artists:

Billy Kluver

- research engineer
- Bell Labs
- 1950’s & 60’s

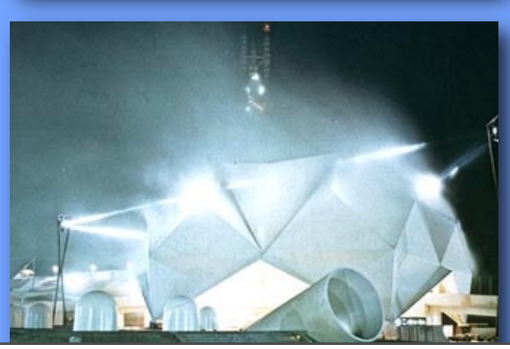


Steve Harrison

Bell Labs

- A few things from the research lab of the phone company:
  - sound motion pictures
  - transistors
  - photovoltaics
  - information theory
  - the bit
  - unix ("linux" and OS X on the Mac)
  - C programming language
  - verified the Big Bang
  - the laser
  - CCD's (digital cameras)
  - 6 Noble prizes

Kluver's Collaborations



- Jean Tinguely
  - "Homage to NY"
- Claes Oldenberg
- Jasper Johns (battery powered neon light)
- Merce Cunningham, Nam Jun Paik, Stan Vanderbeek, & Yvonne Rainer (first wireless FM mic)
- Andy Warhol (mylar balloons)
- Robert Rauchenberg
  - EAT "Experiments in Art & Technology"
  - 9 Evenings of Theater and Engineering
- Pepsi Pavillion - Osaka Worlds Fair

Engineers supporting artists:

Billy Kluver / 9 Evenings of Theater and Engineering

- Open Score
  - Robert Rauschenberg
  - Bell Labs research engineers
  - 3 parts:
    - Augmented reality tennis game
    - night vision audience participation event
    - musical performance

Art inspiring technology

Steve Harrison

Art inspiring technology:

Hole in Space and Media Space

- Hole in Space
  - *Mobile Image* (Rabinowitz and Galloway)
  - 1980
  - Real-time open link from Century City to Lincoln Center
  - life-size images in store fronts

Steve Harrison

Art inspiring technology:

Hole in Space and Media Space

Steve Harrison

Art inspiring technology:

Hole in Space and **Media Space**

- Xerox PARC
- Media Space
  - Stults and Harrison
  - 1985-1989
  - Real-time open link from PARC to Portland satellite office
  - see *HCI Remixed* for story of HIS+M/S

Steve Harrison

Xerox PARC

- Industrial research lab
- Offices and documents
- Two research traditions:
  - Academic-style science
  - Edison-style tinkering
- "Build what you use; use what you build."
- "Best way to predict the future is to invent it"

Xerox PARC

- Laser printing
- Personal computing (BUT NOT THE MOUSE!)
- Object-oriented languages
- Ethernet (used to network personal computers)
- the prototypes that became Adobe Illustrator and Photoshop

Art inspiring technology:

Hole in Space and Media Space

Using always-on video, audio, and computing to fold time and space

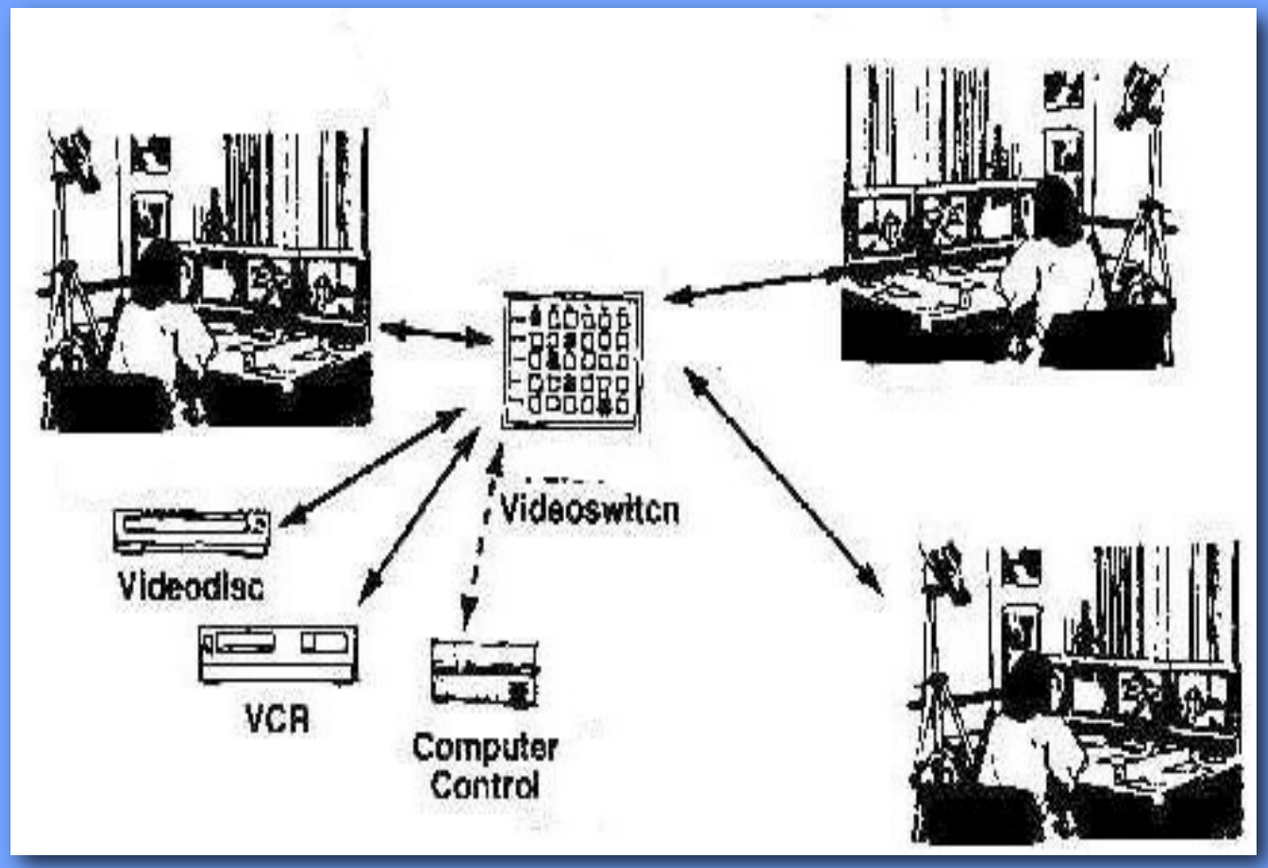
Before there were any cellphone cameras, webcams, Skype or even that media had any legitimacy in CS

Steve Harrison

Art inspiring technology:

Hole in Space and **Media Space**

- lessons from living in *representational* space
  - – The architecture of communicative surfaces
  - – People, events, places
  - – Appropriate behavioral framing
  - – Interaction managed in social space
  - –see *Media Space: 20+ Years of Mediated Life* to learn more about M/S



Steve Harrison

“riffing” and co-producing

Steve Harrison

Engineers and artists "riffing" off one another:

Artist/researcher collaborations

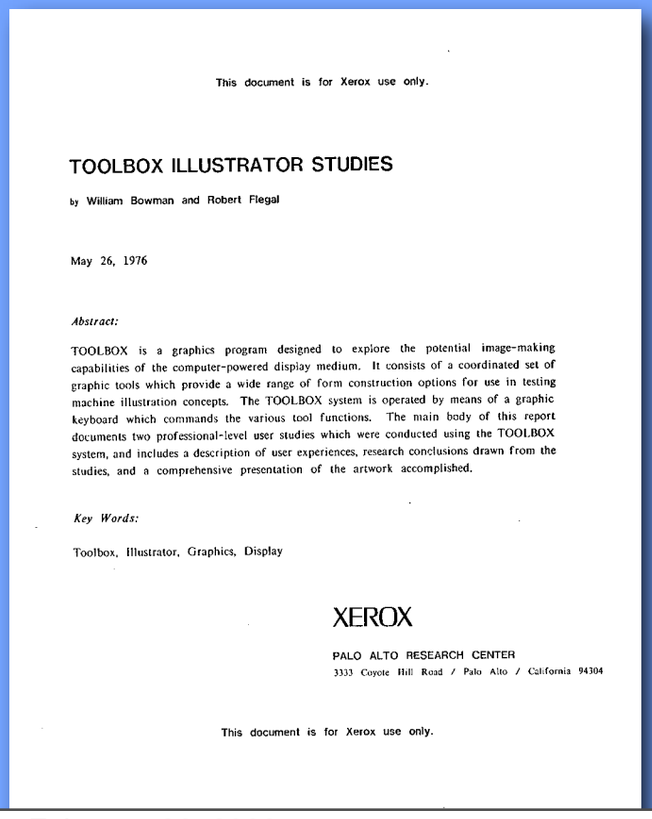
- Examples from Xerox PARC:
  - Bit mapped graphics editor
  - Ubiquitous computing / ambient displays
  - PARC Artist In Residence Program
  - XFR

Steve Harrison

Engineers and artists "riffing" off one another:

The first bit-mapped editor

- Bob Flegal (computer scientist)
- Bill Bowman (graphic designer)



This document is for Xerox use only.

TOOLBOX ILLUSTRATOR STUDIES

by William Bowman and Robert Flegal

May 26, 1976

Abstract:

TOOLBOX is a graphics program designed to explore the potential image-making capabilities of the computer-powered display medium. It consists of a coordinated set of graphic tools which provide a wide range of form construction options for use in testing machine illustration concepts. The TOOLBOX system is operated by means of a graphic keyboard which commands the various tool functions. The main body of this report documents two professional-level user studies which were conducted using the TOOLBOX system, and includes a description of user experiences, research conclusions drawn from the studies, and a comprehensive presentation of the artwork accomplished.

Key Words:

Toolbox, Illustrator, Graphics, Display

XEROX

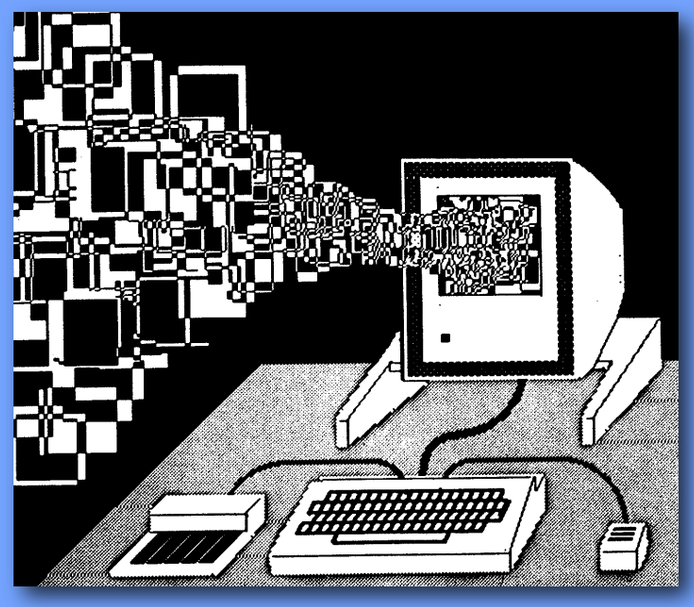
PALO ALTO RESEARCH CENTER
3333 Coyote Hill Road / Palo Alto / California 94304

This document is for Xerox use only.

Engineers and artists "riffing" off one another:

The first bit-mapped editor

- Bob Flegal (computer scientist)
- Bill Bowman (graphic designer)



Engineers and artists "riffing" off one another:

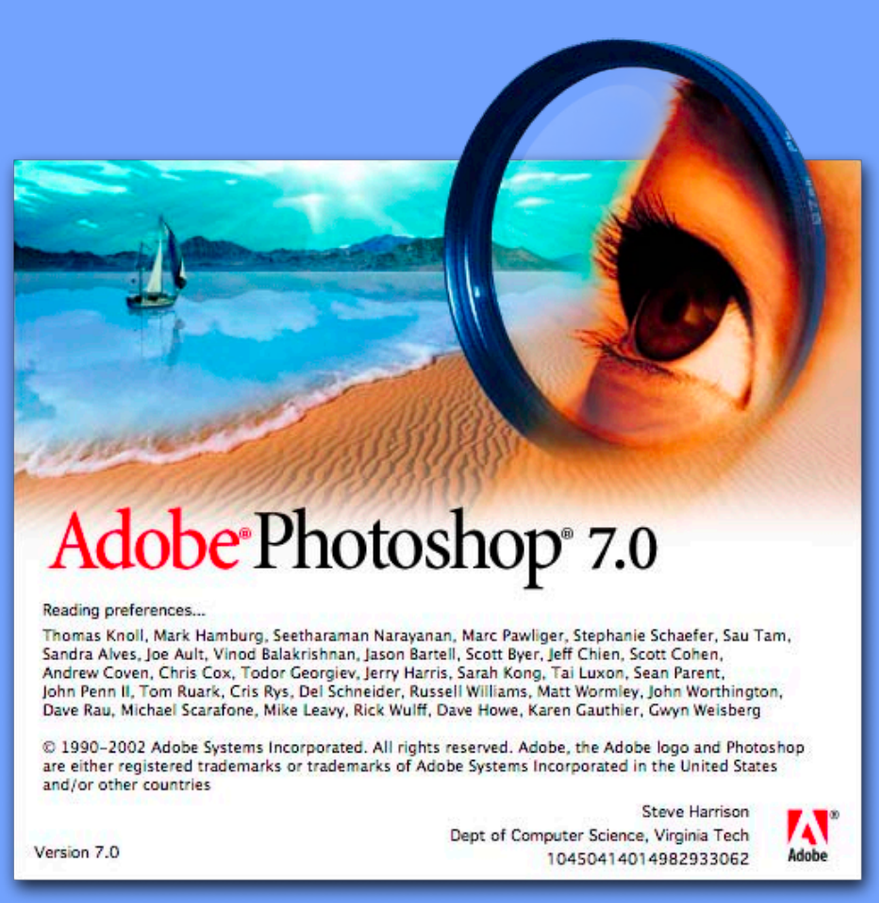
The first bit-mapped editor

- Bob Flegal (computer scientist)
- Bill Bowman (graphic designer)

Engineers and artists "riffing" off one another:

The first bit-mapped editor

- Bob Flegal (computer scientist)
- Bill Bowman (graphic designer)



Engineers and artists "riffing" off one another:

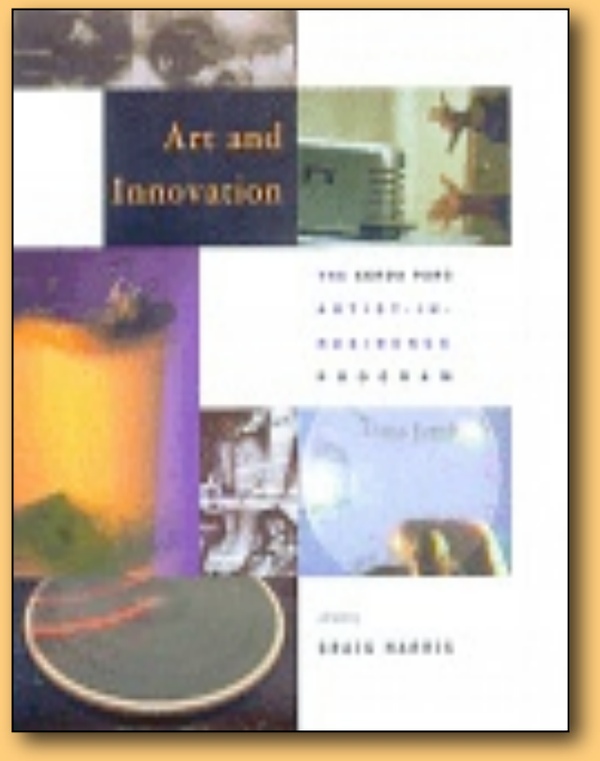
Natalie Jeremijenko

- Came to PARC as part of PAIR program
- LiveWire, Park-ing Lot Project
- "riffing"as a method: re-framing, appropriating

Steve Harrison

PAIR: the PARC Artist in Residence Program

- Modeled after Bell Labs/EAT
- Goal of learning from each other
  - better questions
  - better researchers
  - better artists
- 20+ artists over 8 years

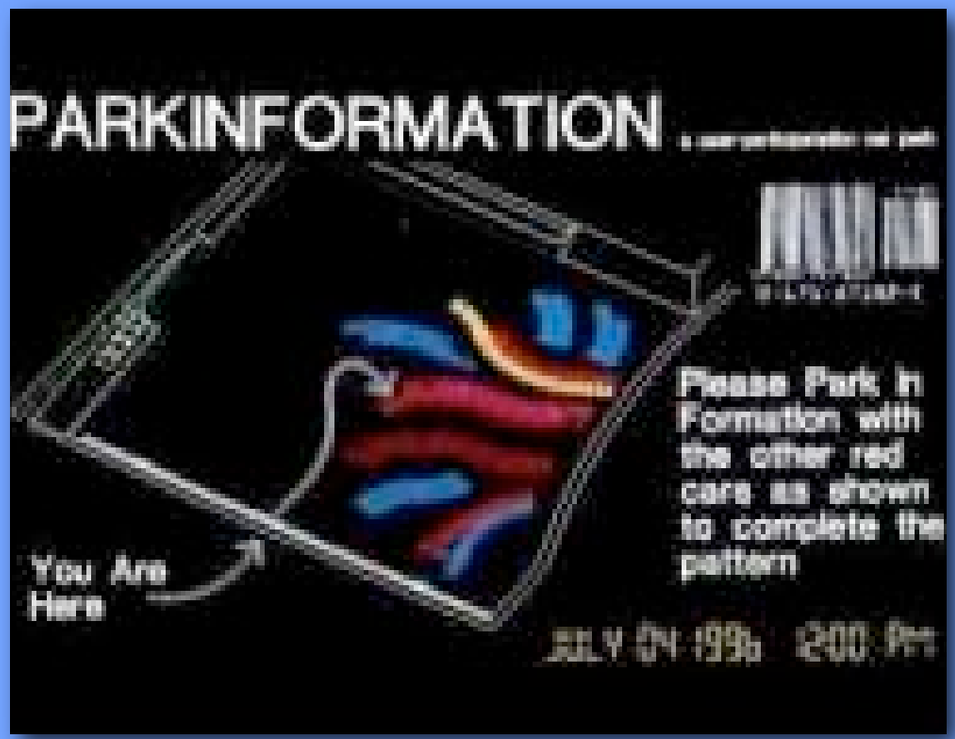


Steve Harrison

Engineers and artists "riffing" off one another:

Natalie Jeremijenko

- LiveWire (Weiser)
- Spinning string, ethernet traffic
- Ambient display
- Awareness



- Park-ing (Harrison and Minneman)
- Everyday life as art
- Ubi comp

Steve Harrison

Engineers and artists “riffing” off one another:

Blurring the boundaries

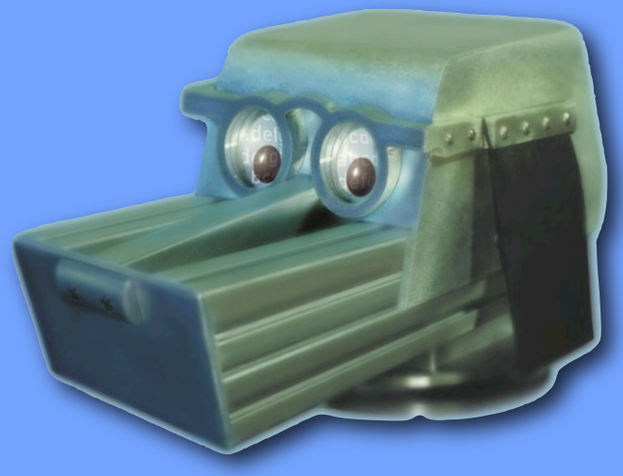
Steve Harrison

Using the ideas and ways of seeing of art to drive research

- PARC and Xerox agenda: Document research
  - in this model, *CS is a tool*
  - PARC research >>> *"inventing things that make things that people read"*
  - Xerox business >>> *"making things that make things that people read"*
- Art method: Critical theory:
  - *Genre* as a method of research
  - Investigation of systems of *meaning*

Steve Harrison

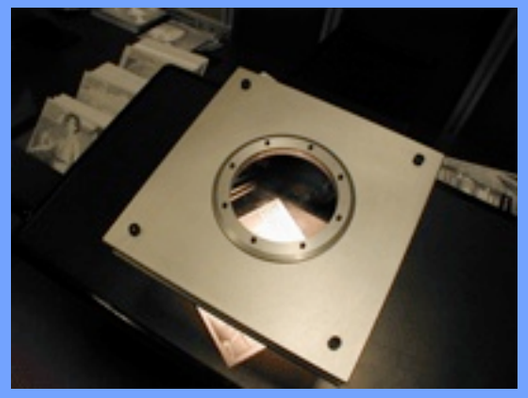
XFR: eXperiments in the Future of Reading

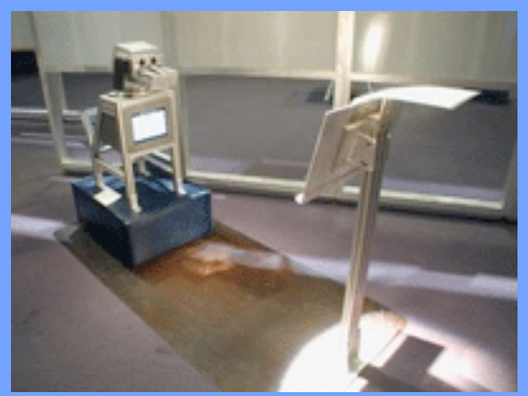


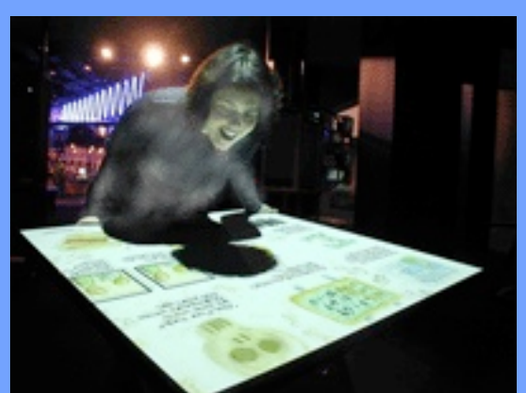
A research project and an installation exploring the relationship between reading and technology

Steve Harrison

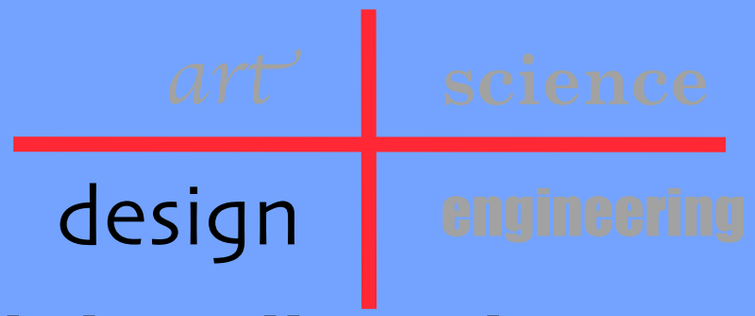
XFR







Steve Harrison



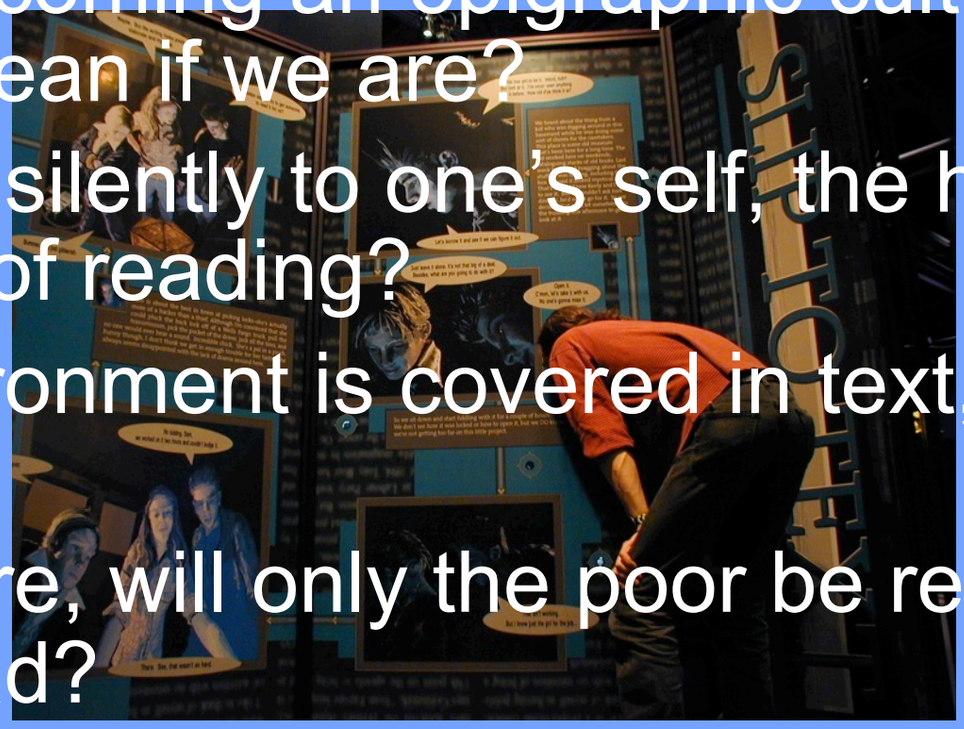
Are these product prototypes, entertaining diversions, research demos, or what?

The exhibits are like concept cars.
They set ideas into an accessible context.
They speak to people who set strategic direction inside companies, knowledgeable opinion leaders and the public.

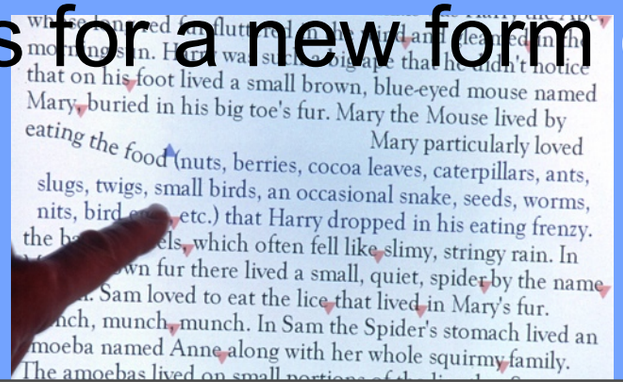
Steve Harrison

art | science
design | engineering

Some research questions raised by XFR:



- Are we becoming an epigraphic culture and what would it mean if we are?
- Is reading silently to one's self, the highest and best form of reading?
- If the environment is covered in text, how will it all be read?
- In the future, will only the poor be required to know how to read?
- Is dynamic text the basis for a new form of symbolic interaction?



Steve Harrison

How to apply this?

art	**science**
design	**engineering**

Steve Harrison

Art+Engineering as Pedagogy:

What can be learned

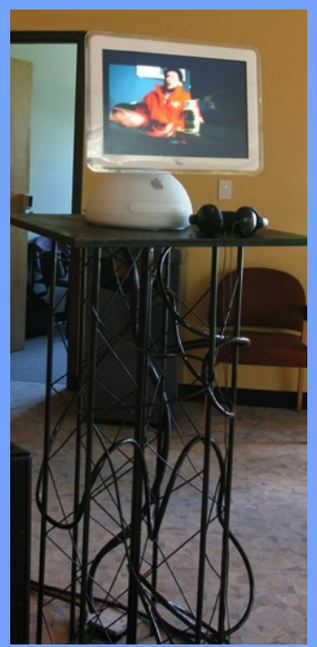
- Collaboration practices between disciplines
- Comparative aesthetics
- Comparative problem solving
- Methods as a door to designing design (aka “It’s Just a Method”)

Steve Harrison

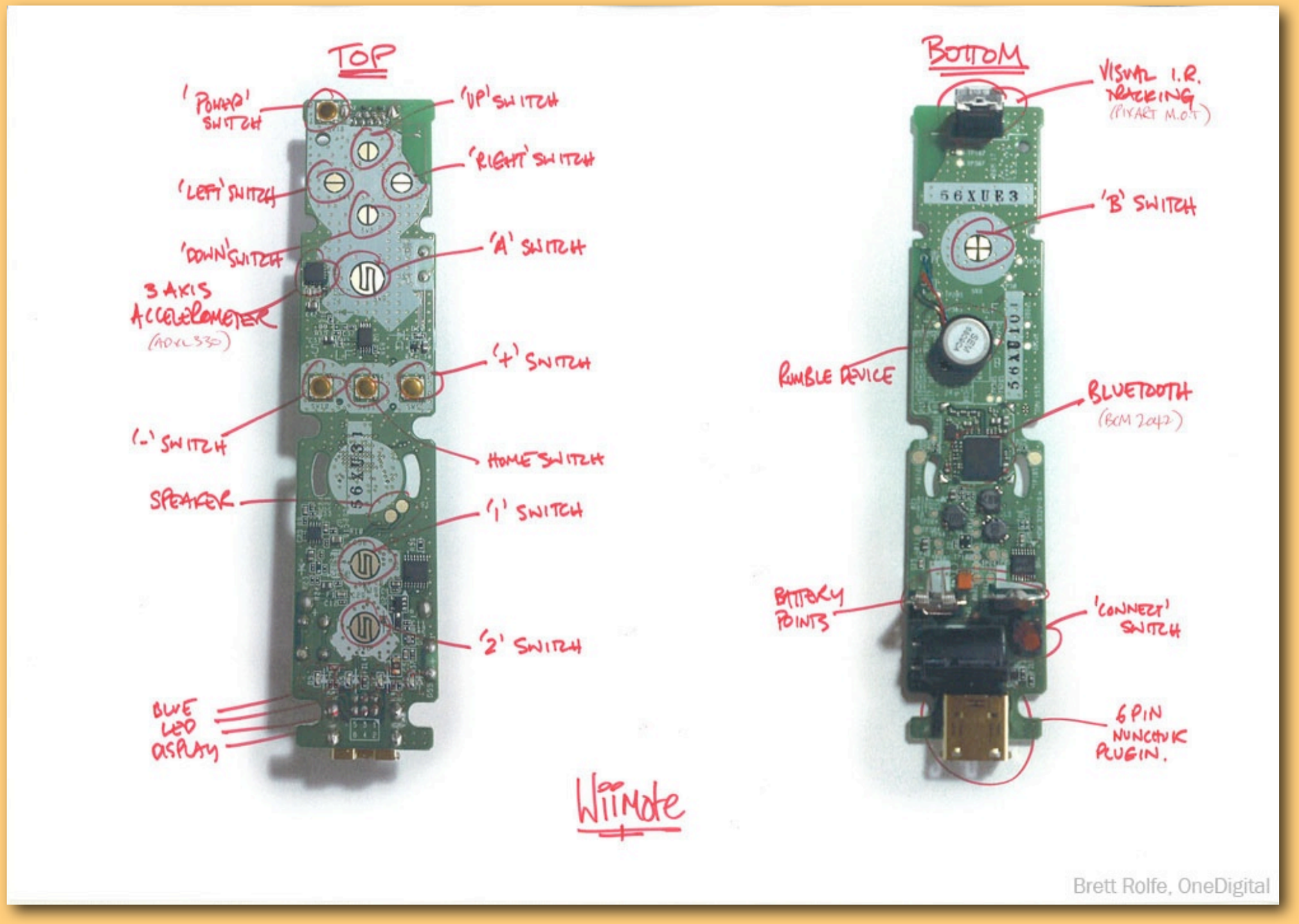
Art+Engineering as Pedagogy:

Creative Computing Capstone Studio (cs 4644)

(aka “CyberArt”)



Steve Harrison



Steve Harrison

Thursday, February 26, 2009

Art+Engineering as Pedagogy:

Creative Computing Capstone Studio

(aka “CyberArt”)

Art+Engineering as Pedagogy:

What can be learned

- Collaboration practices between disciplines
- Comparative aesthetics
- Comparative problem solving
- Methods as a door to designing design (aka “It’s Just a Method”)

Steve Harrison

Art+Engineering as Research:

Research Themes

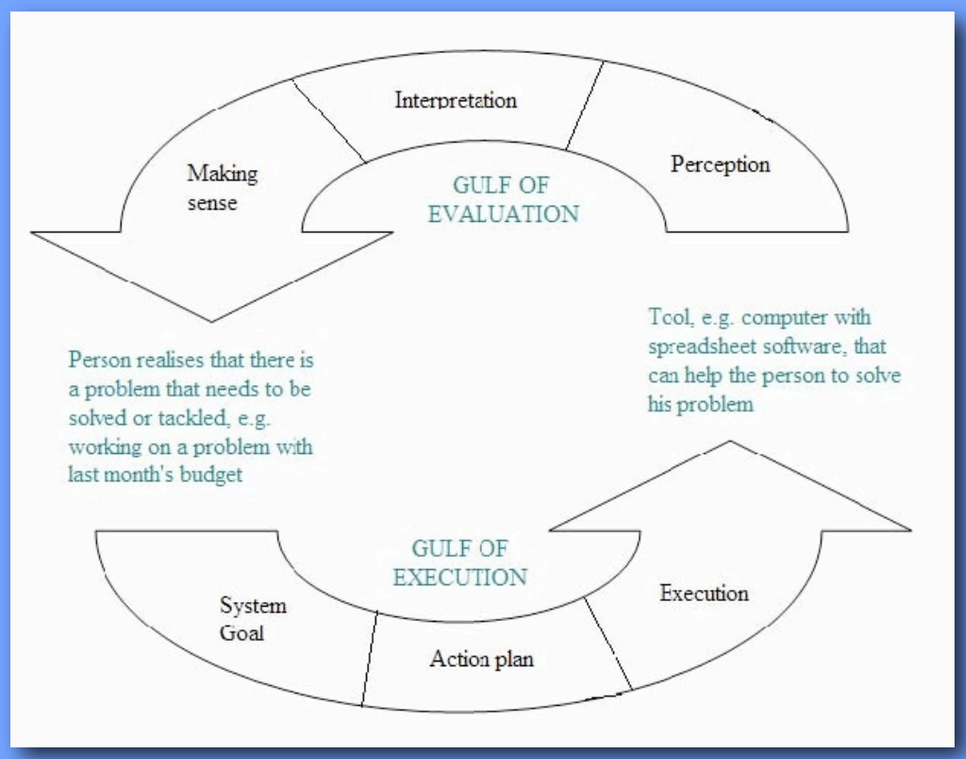
- Technology in Place
- Architectural Scale Display
- Meaning

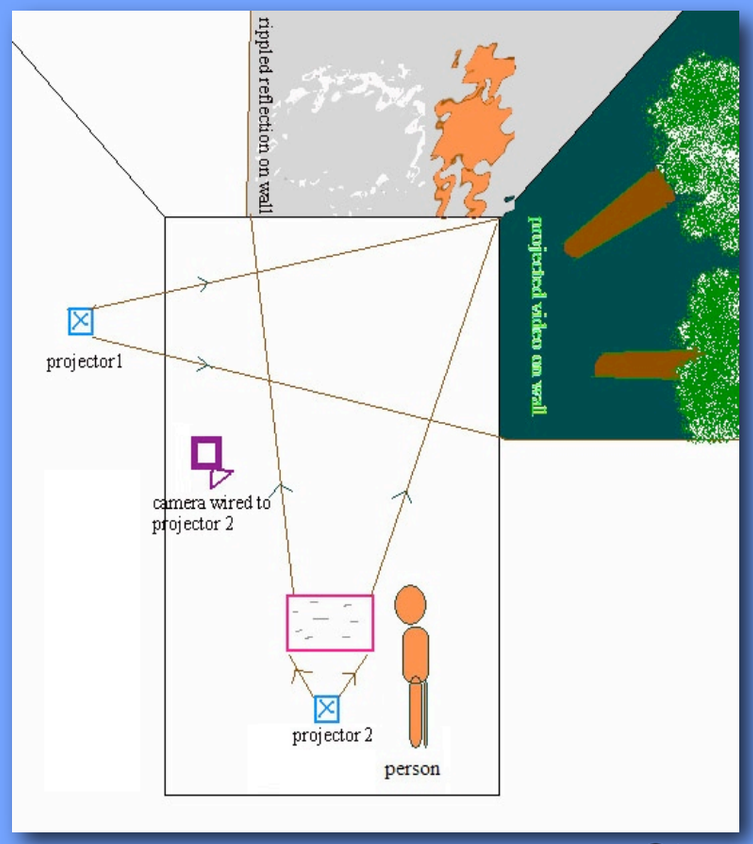
Steve Harrison

Architectural Scale Display:
Meaning:

SenSpace

- Kunmi Otitoju
- Meaning of interaction



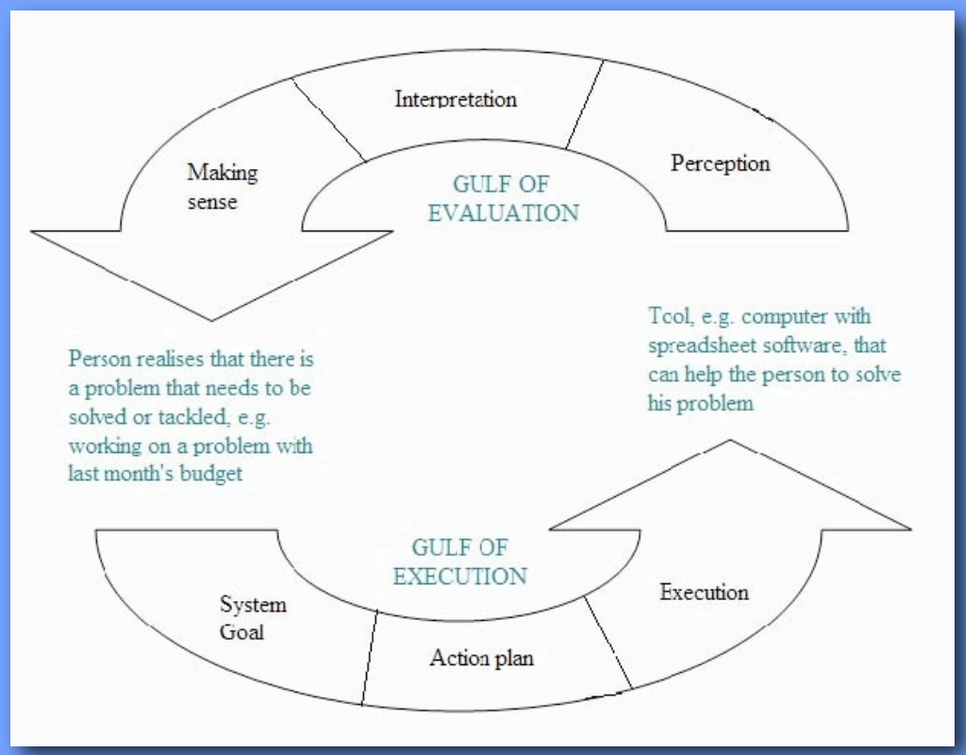


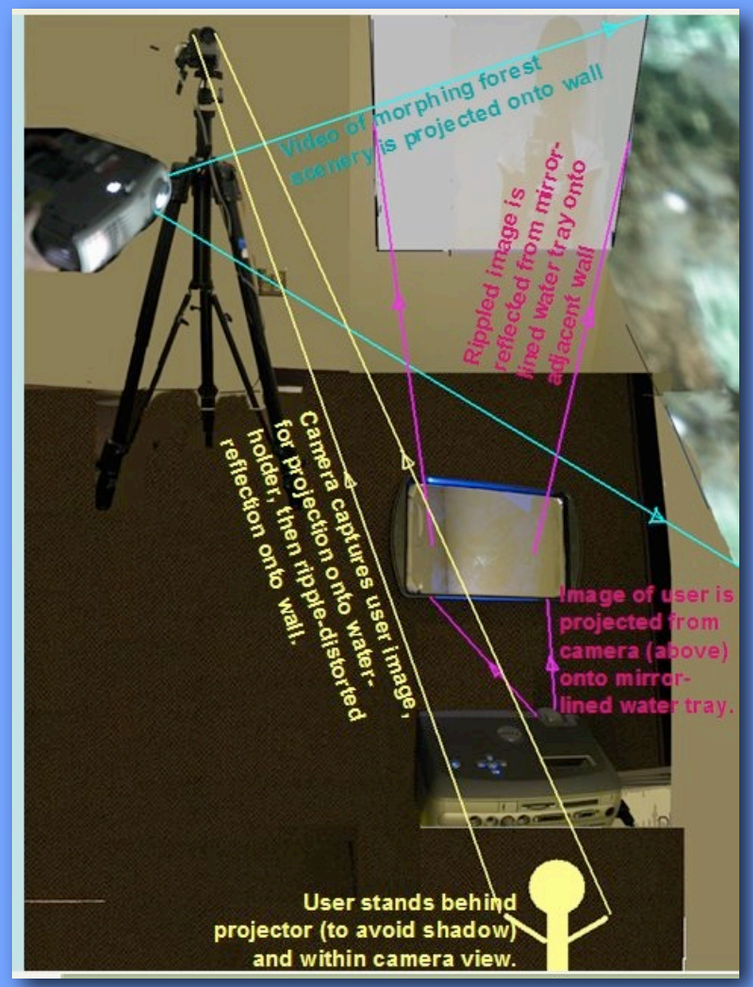
Steve Harrison

Architectural Scale Display:
Meaning:

SenSpace

- Kunmi Otitoju
- Meaning of interaction





Steve Harrison

Meaning:

Cheats

- Rob Hardy
  - multiplayer games
  - effect on player and other players
- Bobby Beaton
  - cheating in single-player experiential games like GuitarHero, Rock Band, and MarioKart
- What is a “cheat”?
- Why use a cheat?
- What makes a good cheat?

Technology in Place:
Meaning:

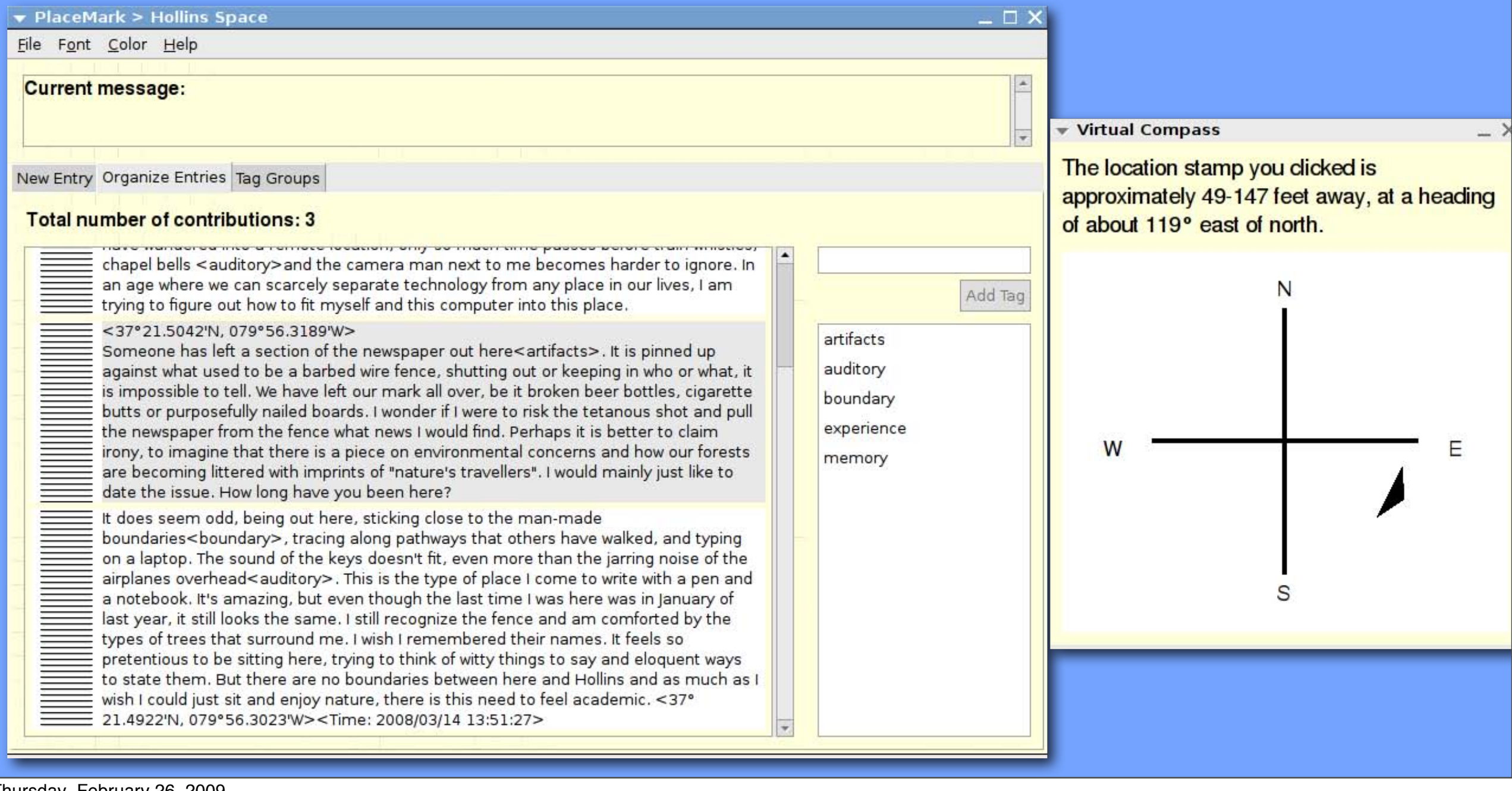
PlaceMark

- with DeborahTatar and Jen Boyle @ Hollins U
- (aka Vivid Embodiment)
- Joon Lee, Bobby Beaton, Matt Schaefer and Ali Crandall/Hollins U

- writing in place(s)

Technology in Place:
Meaning:

PlaceMark



What art can bring to collaboration

- does not need a “problem” to be solved
- art “problems” are always on the table
- no stopping rule
  - to project
  - to boundaries
- an emphasis on “seeing” (often through doing)

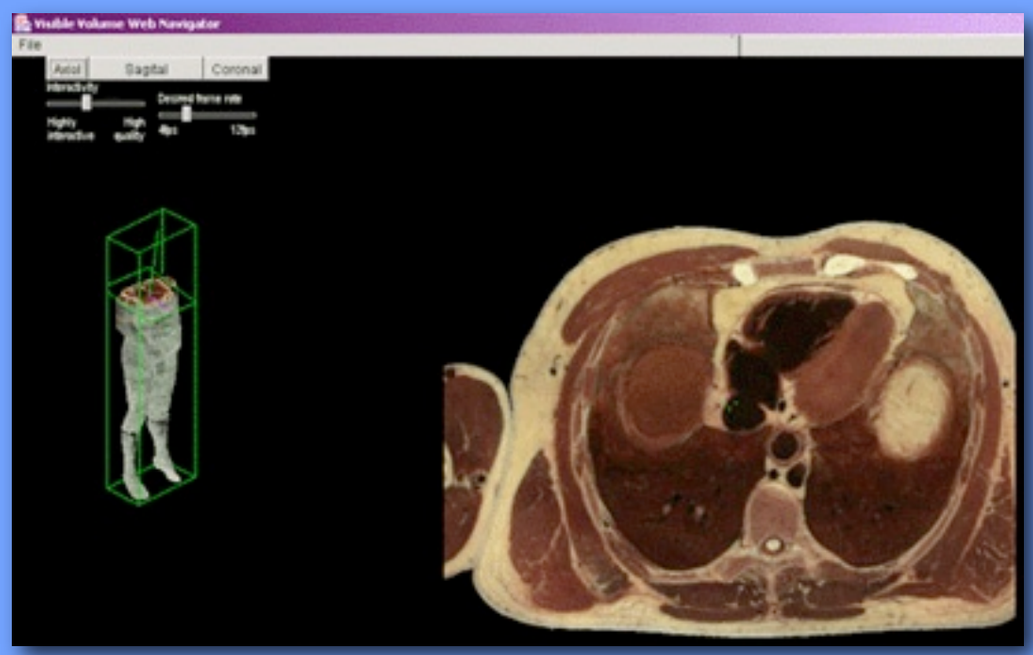
Steve Harrison

What art can bring to collaboration
- entrepenurial energy

- does not need a “problem” to be solved
- art “problems” are always on the table
- no stopping rule
  - to project
  - to boundaries
- an emphasis on “seeing” (often through doing)

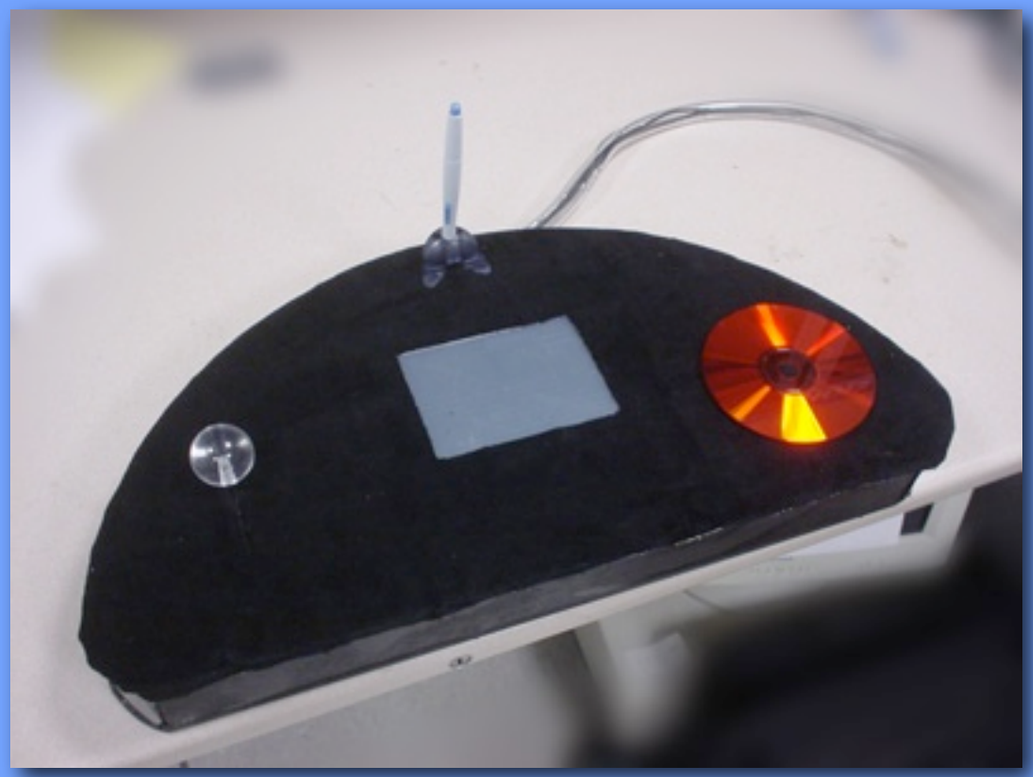
Steve Harrison

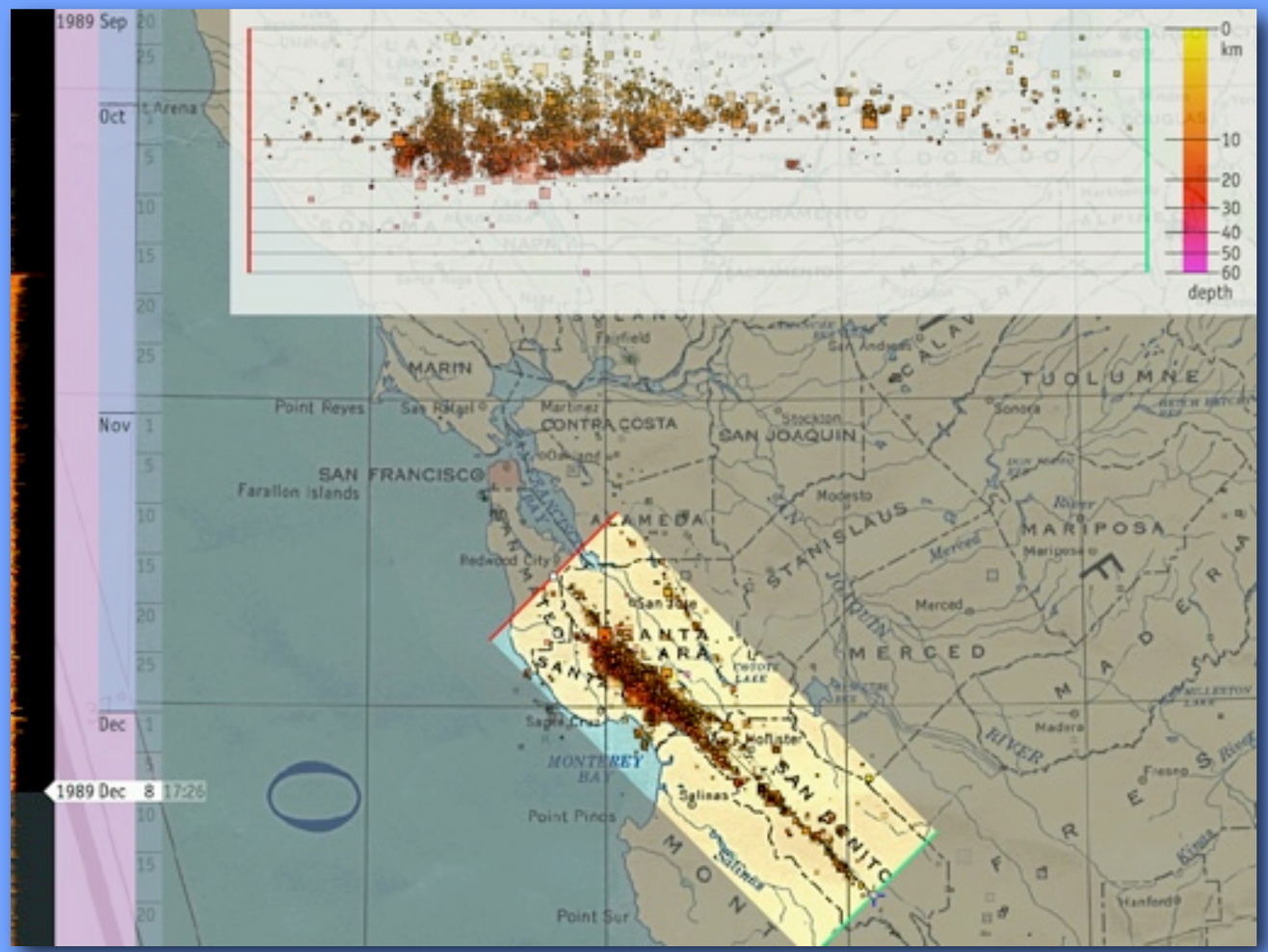
Eeewww



Steve Harrison

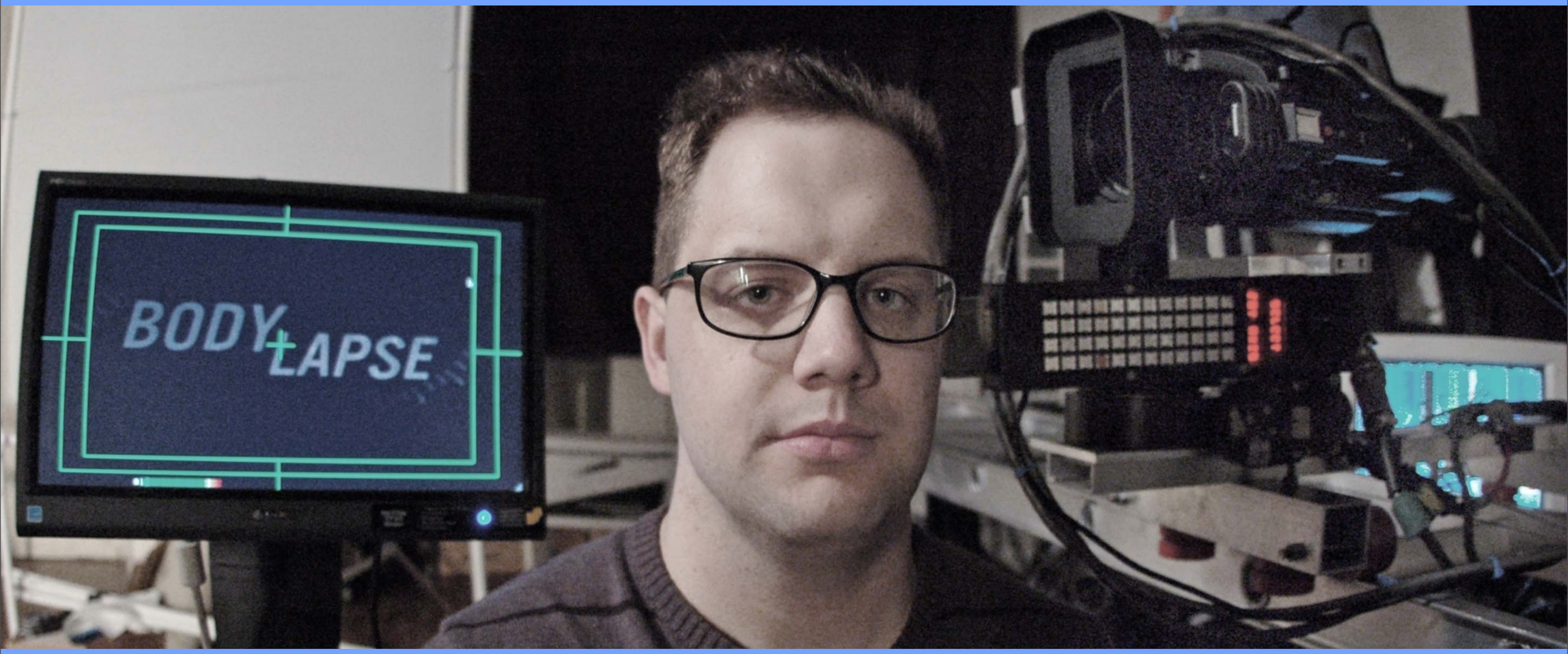
QuakeView





Steve Harrison

Body Lapse



Body Lapse


BODY LAPSE™
214
charles atlas
head roll
bike
pushups
situps
lifting weights
charles atlas
the terminator
front
back
side
face
01

Body Lapse


BODYLAPSE™
214
charles atlas
head roll
bike
pushups
situps
lifting weights
charles atlas
the terminator
front
back
side
face
01

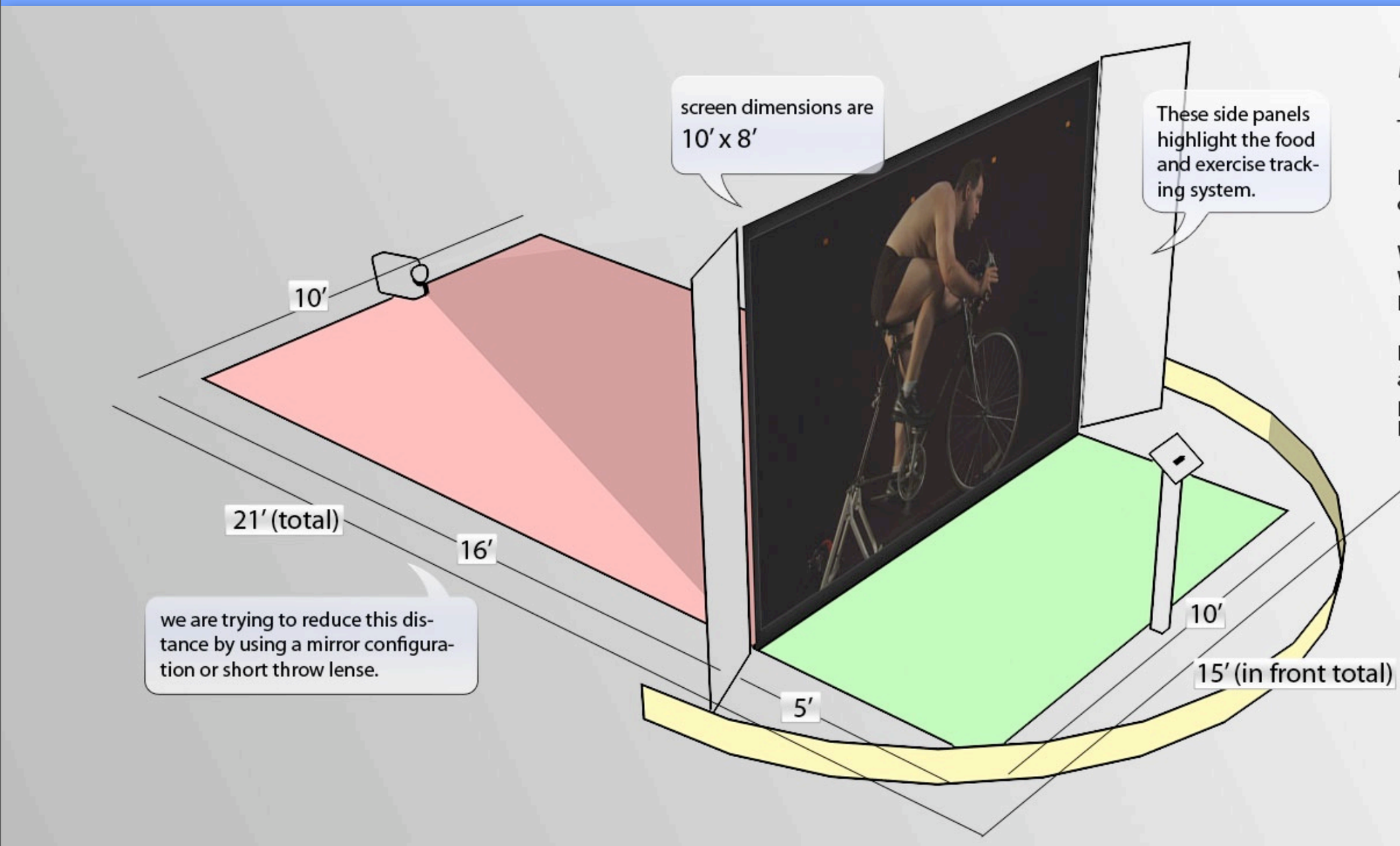

BodyLapse Tracker
edit
Food
Strength
Cardio
Weight

Body Lapse


chiquita apple bites 11:30 am
(several items) 11:30 am
buffalo meat 11:30 am
special k bar 02:30 pm
dijon, spinach salad 05:30 pm
(several items) 06:10 pm


BodyLapse Tracker
edit Food
+ Strength
+ Cardio
+ Weight

Body Lapse



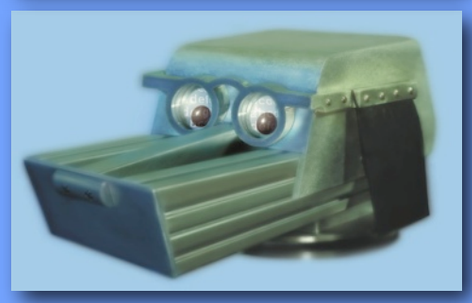
BodyLapse

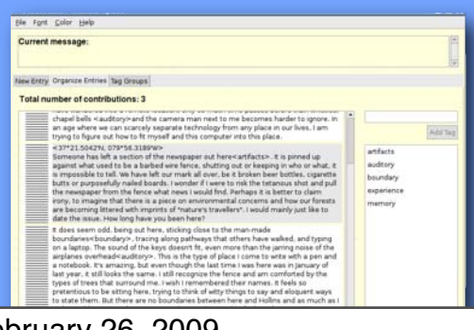
Total Dimensions:

Length (back of display to front control pedestal):21′

Width (behind display):10′
Width (in front of display):15′
Height (total):8′

Lighting considerations: We are aiming to use a 2500-4500 lumen projector so an area with lower ambient light would be preferable.

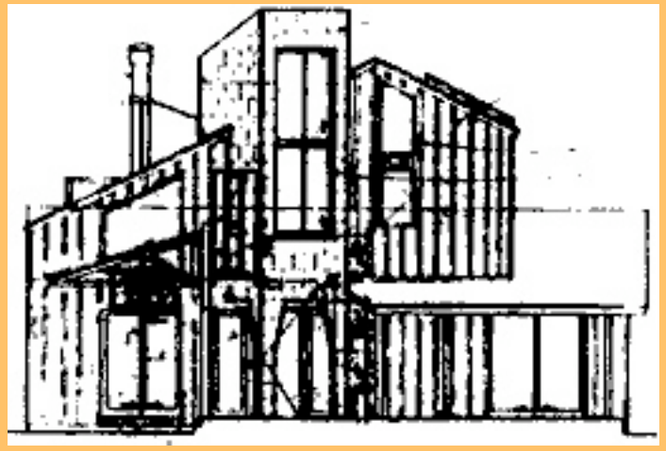




- What is research?
- Art, science, design and engineering
- Some modes of cross-disciplinary collaboration
  - Support
  - Inspire
  - “riff” and co-produce
- Blurring the boundaries
  - Genre-based research
  - XFR: research project and installation
- Post 20th Century collaborations

Steve Harrison

Thank You



Steve Harrison

SHarrison@cs.vt.edu