Multitouch and Multiuser Design

Museums and the Web 2011

Jim Spadaccini
jims@ideum.com
Paul Lacey
paul@ideum.com

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Multitouch & Multiuser Design Outline

- Multitouch = Multiuser Exhibits

- MT Tables vs. Kiosks: Using Traditional Measures

- Evaluation of MT Tables at Vancouver Aquarium

- Case Studies: How the Tech Works

10:00- 10:15 <break>

- Case Studies: Design - Success! + Failures ;-(

- Design Activity!
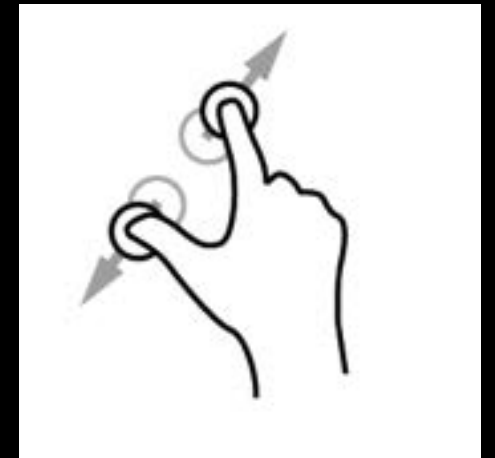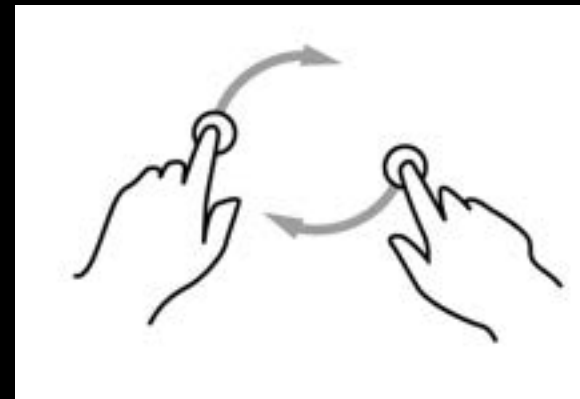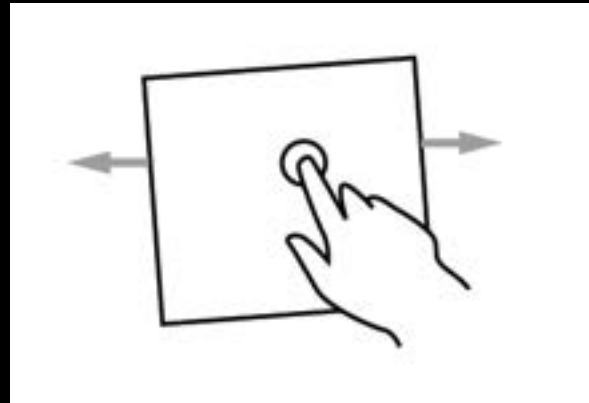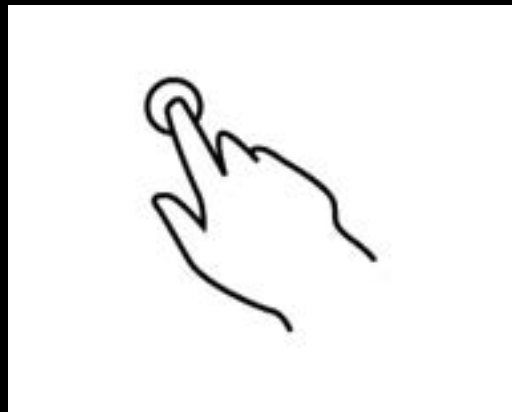
Multitouch & Multiuser Design: About

- Many of our own examples are presented (since we know them best), and we can be self-critical.

- Workshop Structure is 50% presentation & discussion, 50% activity. Ask questions anytime.

This workshop is not about mobile...except...

tap, drag, scale, rotate.

...that's how a small set of "intuitive gestures" have emerged. And one really cool demo at the end of the workshop.

Multitouch = Multiuser =

Massive Changes in Computer Exhibits in Museums

60" Multitouch Wall 2007
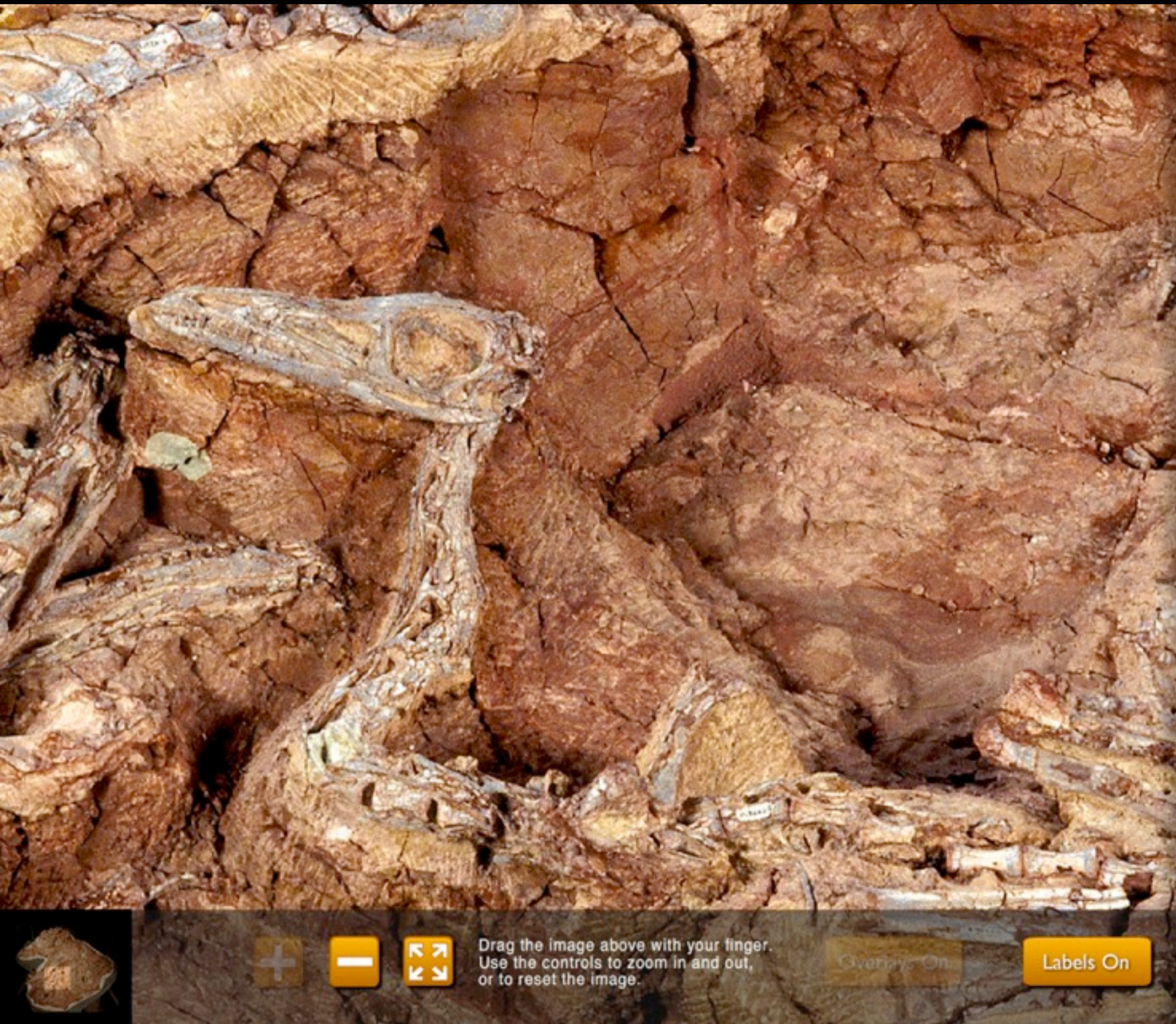
Frustrated Total Internal Reflection

Suitcase Multitouch Screen 2008

New Mexico Museum of Natural History - April 2008

Larry Rinehart: Museum Paleo Preparator

Select a question to view the video commentary

1 **What is the Furcula?**

2 **What is the Sclerotic Ring?**

3 **What are Gastralia?**

4 **Smallest and Largest Specimens**

5 **Where do we find Coelophysis and when did they live?**

6 **Why are there so many species together in this block?**

7 **What kinds of adaptations did Coelophysis have?**

Drag the image above with your finger. Use the controls to zoom in and out, or to reset the image.

Labels On

Don Harrington Discovery Center - January 2009

Vancouver Aquarium - July 2009

Tables vs. Kiosks

Using Traditional Exhibit Measures

PRINCIPLES OF EXHIBIT DESIGN

Steve Bitgood and Don Patterson
Jacksonville State University

In the last issue (Bitgood & Patterson, 1987), we described some principles that apply to orientation and circulation. In the next to the last issue the empirical factors involved in the design of effective exhibit labels were discussed (Volume I, No. 3). The current article will describe principles of visitor behavior that relate to three other aspects of exhibit design: (1) the characteristics of the exhibit object or animal; (2) the characteristics of exhibit architecture; and (3) the characteristics of the visitors. The list of principles does not claim to be exhaustive; we hope that it stimulates your thinking and challenges you to further test their validity. Most of these principles have at least some empirical basis; however, additional research is needed to confirm these effects, to discover the specific parameters of each variable, and to determine the relative impact of each factor on visitor behavior. We are indebted to the work of others for ideas on many of these principles (e.g., Koran & Koran, 1986; Melton, 1972; Screven, 1986).

Exhibit Object/Animal Factors

1. Size. *Larger objects or animals produce longer viewing times than smaller ones.*

Bitgood, Patterson, Benefield, & Landers (1986) found a strong correlation between animal size and viewing time for zoo exhibits. Marcellini & Jensen (1986) reported similar results in the National Zoo's reptile house.

2. Motion. *Moving objects or animals produce longer viewing times than stationary ones.*

Melton (1972) reported greater visitor attention to a moving machine in a science museum. Bitgood et al.

5. Sensory Qualities. *Exhibit objects or animals appear to have greater interest if a second sensory mode is added to the visual mode.*

Peart (1984) found that adding sound to an exhibit increased its attracting and holding power. Koran, Koran, and Longino (1986) found that adding touch to an exhibit substantially increased the time at an exhibit. It is unknown if other sensory systems have a similar effect on visitors.

6. Interactive Elements. *When visitors' responses produce a counterresponse, viewing time is increased.*

Melton (1972) reported increased visitor attention in an electricity exhibit when an interactive element was present. Bitgood et al (1986) found that a push button device that enacted a light in an otters' den produced longer viewing times than similar exhibits without the light. Other examples include interactive computers, staff answering visitors' questions, and visitor feeding/animal begging interactions.

7. Triangulation. *More exciting exhibits appear to act as a catalyst for social interaction between visitors.*

Whyte (1980) suggested that there are certain events such as street performers and unusual sculpture that stimulate social contact between strangers in the street. This principle of triangulation appears to operate in exhibition-type facilities also: the more interesting the exhibit, the more likely it will stimulate social contact. Serrel (1981) demonstrated this effect when new exhibit labels were installed at the Brookfield Zoo.

Architectural Factors

1. Visibility. *The greater the ease of visibility with which the object can be viewed, the more attention the object or animal will receive.*

Visibility is assumed to be influenced by at least three variables: (1) level of lighting; (2) visual obstacles; and (3) visual screens (Bitgood et al, 1986). Level of lighting becomes a factor when the level is so low that

Principles of Exhibit Design

1. <u>Size.</u> Larger objects or animals produce longer viewing times than smaller ones.

2. <u>Motion.</u> Moving objects or animals produce longer viewing times than stationary ones.

3. <u>Novelty.</u> Exhibit objects and animals that are novel attract more attention than common ones.

4. <u>Other Intrinsic Qualities.</u> There are certain qualities of an exhibit object or animal that are intrinsically interesting.

5. <u>Sensory Qualities</u>. Exhibit objects or animals appear to have greater interest if a second sensory mode is added to the visual mode.

6. <u>Interactive Elements.</u> When visitors' responses produce a counter response, viewing time is increased.

7. <u>Triangulation.</u> More exciting exhibits appear to act as a catalyst for social interaction between visitors.

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Evaluation

Vancouver Aquarium Visitor Study

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Gammarus wilkitzkii
Raskoff /MPC

Watch the Ayles Ice
Shelf break off in 2005.

Canada's six ice
shelves are

About the Study

Conducted by InnoVis Group; Interactions Lab
Department of Computer Sciences
University of Calgary, Canada

• Two multitouch tables were part of the Canada's Arctic exhibition at the Vancouver Aquarium.

• Table were placed in a space with large fish tanks, information murals, and other interactive displays.

Methodology

• Field notes and recorded video captured visitor interaction. 20 hours of video data was captured.

• InnoVis Group also recruited groups of visitors and accompanied them through the exhibit space.

• The study was conducted over a couple of days. The evaluators were not affiliated with Ideum or Vancouver Aquarium.

General Acceptance

• Multitouch tables are still a novelty. Visitors posed in front of the tables and took pictures of the hardware and interfaces.

• Tables were in nearly constant use. Children approached the tables without any hesitation. Adults were more tentative, but still very interested.

• Many visitors' attention would shift from tables to murals and fish tanks and vice-versa. This indicates "A combination of both digital and traditional information presentation can therefore greatly enhance visitors' experience of exhibitions"

Positive Experience of Touch

• Multitouch interaction was experienced as fun and playful. "Nearly all visitors that payed attention (to the tables) tried to touch them at some point."

• "All recruited participants were were familiar with direct-touch technology through the use of cell phones or portable music players, and all but one had at least some experiences with large interactive displays."

• "Our observations and statements from participants show that visitors were able to quickly understand how to control the digital tables without instructions."

Form Factor Invites Appropriation

- "With its horizontal surface that resembles traditional tabletop surfaces, visitors frequently treated both tables as a robust basic commodity"

(a) Food items and toys on the Collection Viewer table. (b) Child lying on the Arctic Choices table and reaching for the lens tool. (c) Woman sitting on the Arctic Choices table.

User Interface Summary

The study explores the software developed for both tables in depth. Some quick findings on the Collection Viewer.

• "Play" was an important factor, it served as an important "entry point" to the exhibits.

• The exhibit had a long visitor engagement time, 2.17 minutes.

• Children interacted longer 2.39 minutes vs. 1.94 minutes for adults. Children were also more likely to repeat visit (20% vs. 14%)

User Interface Summary

• Control of media items was easy to understand. Fine control of objects was more difficult.

• Exploration was driven by curiosity and quality of visual elements.

• Nuance of controls: button size & placement were an issue for some users.
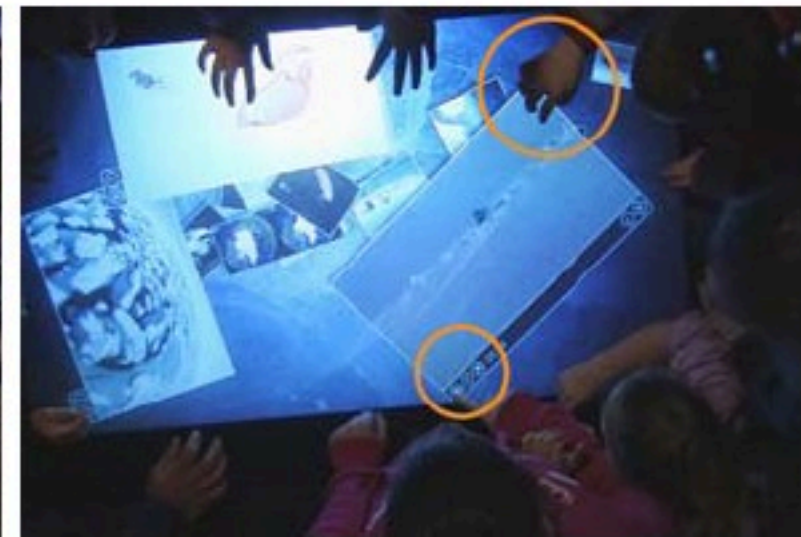
User Interface Summary

- Information exploration in parallel was observed, but the exhibit also encouraged "collaborative information exploration."

(a) Mother guiding child's hands in a resizing gesture.

(b) A group of visitors (around the far side of the table) watching a video together.

(c) Visitor group bringing a video item into the right position.

Questions or Thoughts about...
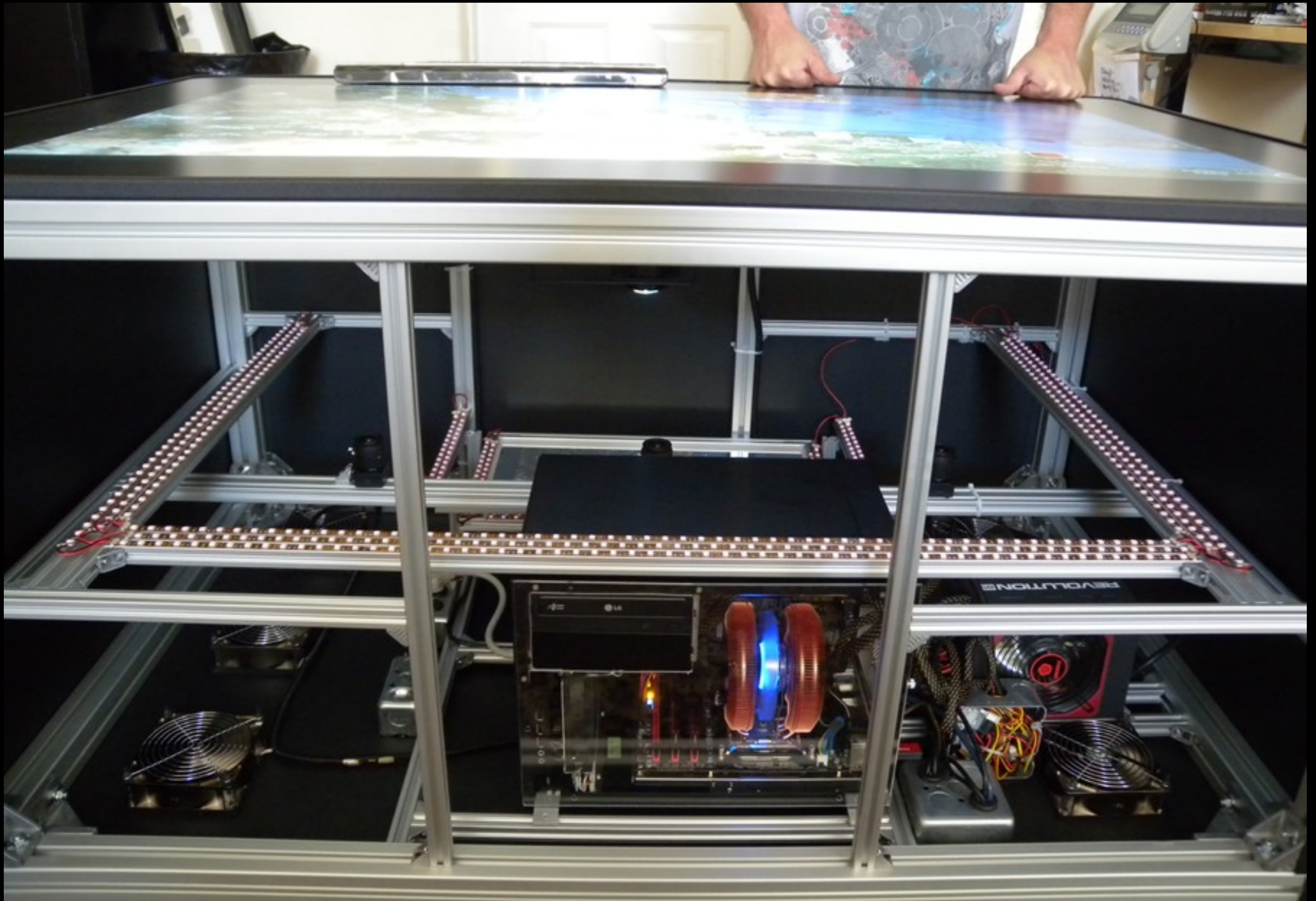
Evaluation

Vancouver Aquarium Visitor Study

Case Studies

How the Tech Works - Projection, LCD, and various touch technologies...
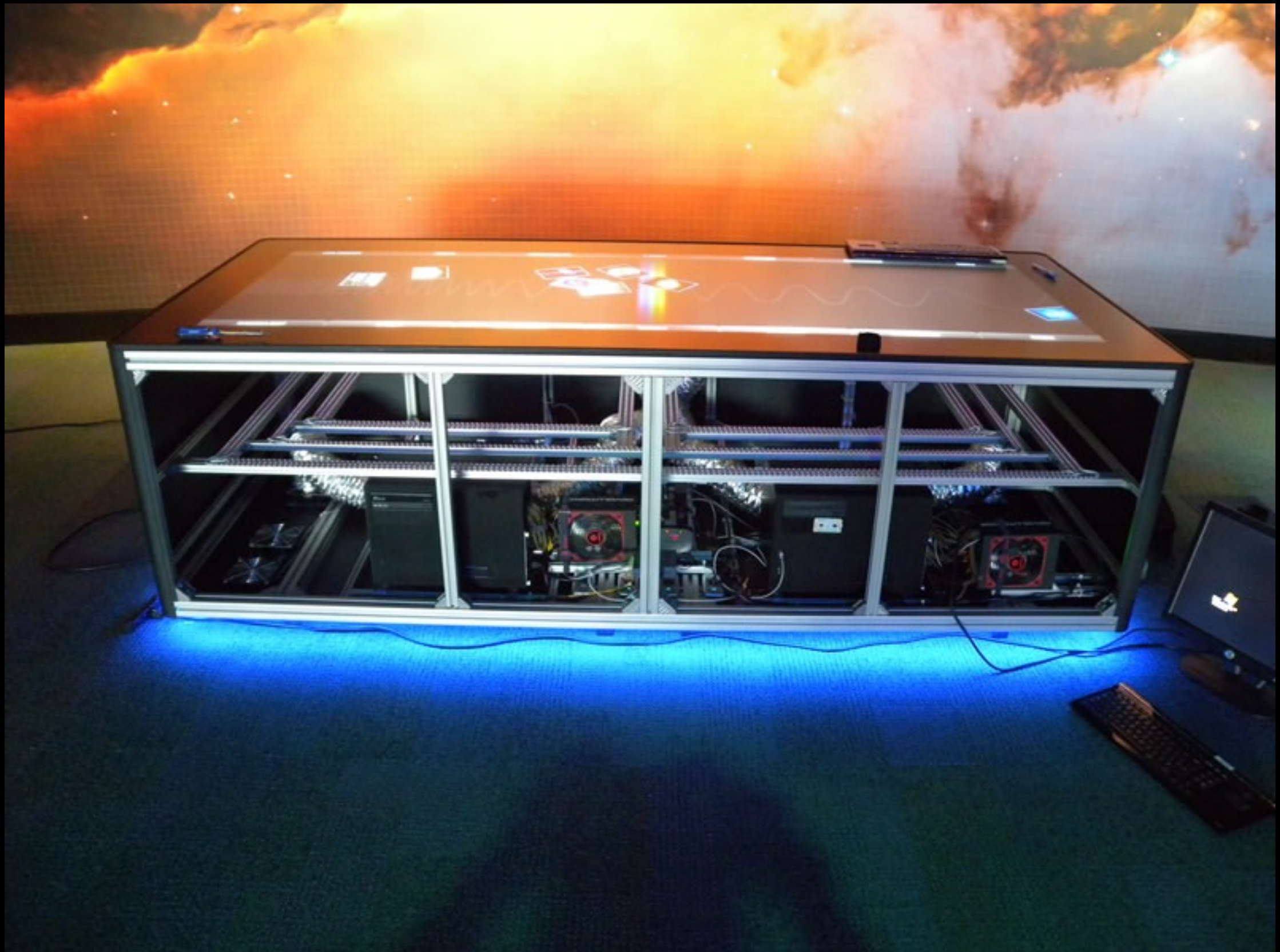
Projection-Based Systems

Microsoft Surface

MT50 Table 2010

Under The Bonnet

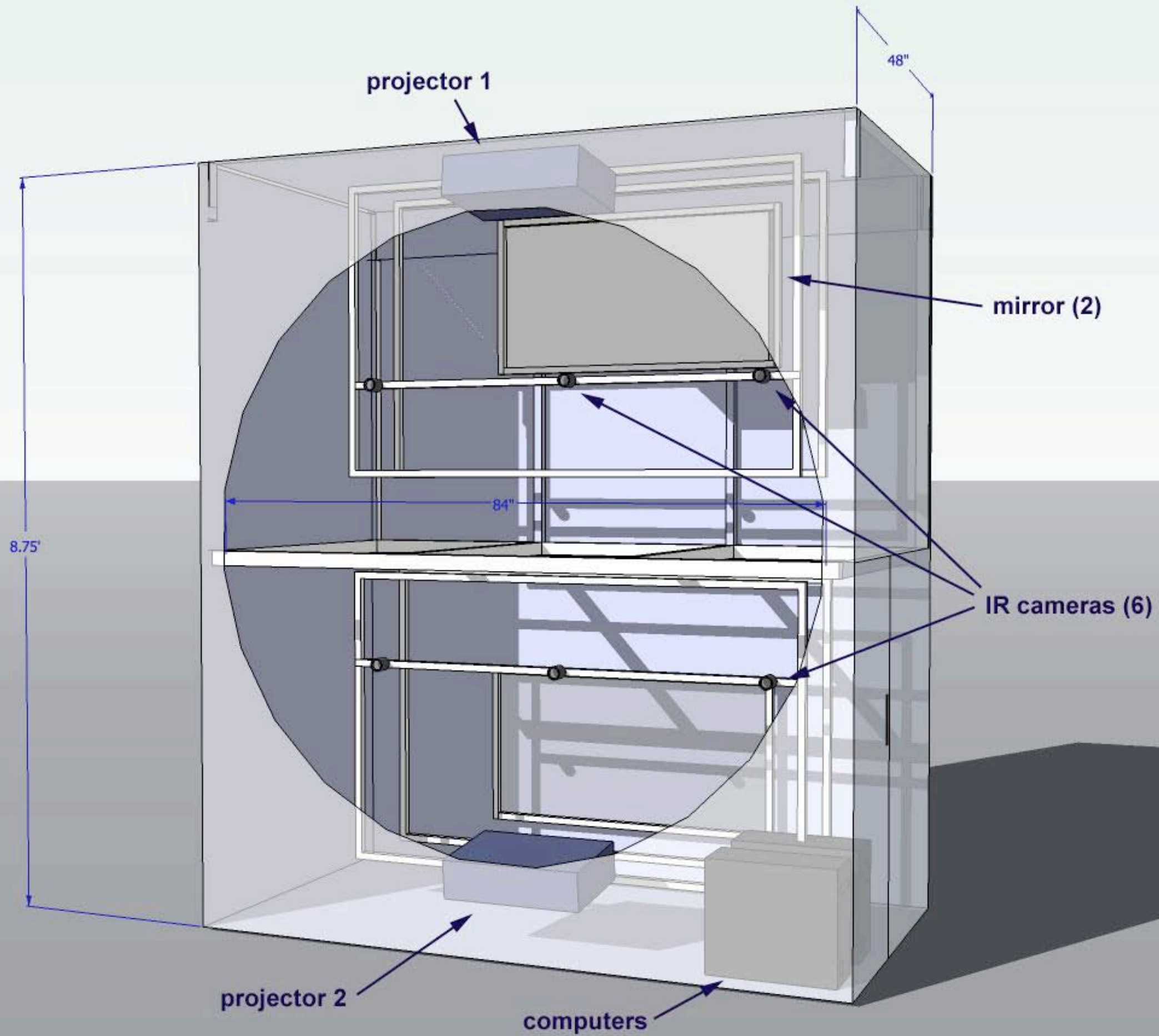Star Spangled Banner
Top Projection Table
Potion Design

DialogTable
University of Michigan
Museum of Art and Kinecity
& Night Kitchen Interactive

11' 8"

7'

1' 5"

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projector 1

48"

mirror (2)

84"

8.75'

IR cameras (6)

projector 2

computers

LCD-Based Systems

GestTable 42" LCD

Multitouch.fi LCD

Yiwarra Kuju | One Road Interactive Table

by Lightwell

7 months ago

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Show me   Lightwell's videos   ▼   See all

9. Dangerous Australians - Australian Museum
by Lightwell
1 year ago

8. Forgotten Songs (v2)
by Lightwell
1 year ago

7. Be a World Leader - Australian Museum

The One Road interactive table at the National Museum of Australia tells the story of the Canning Stock Route's impact on Aboriginal people, and the importance of the Country that surrounds it, through the works of senior and emerging artists and the stories of traditional custodians.

Flag this video   Switch to Flash player

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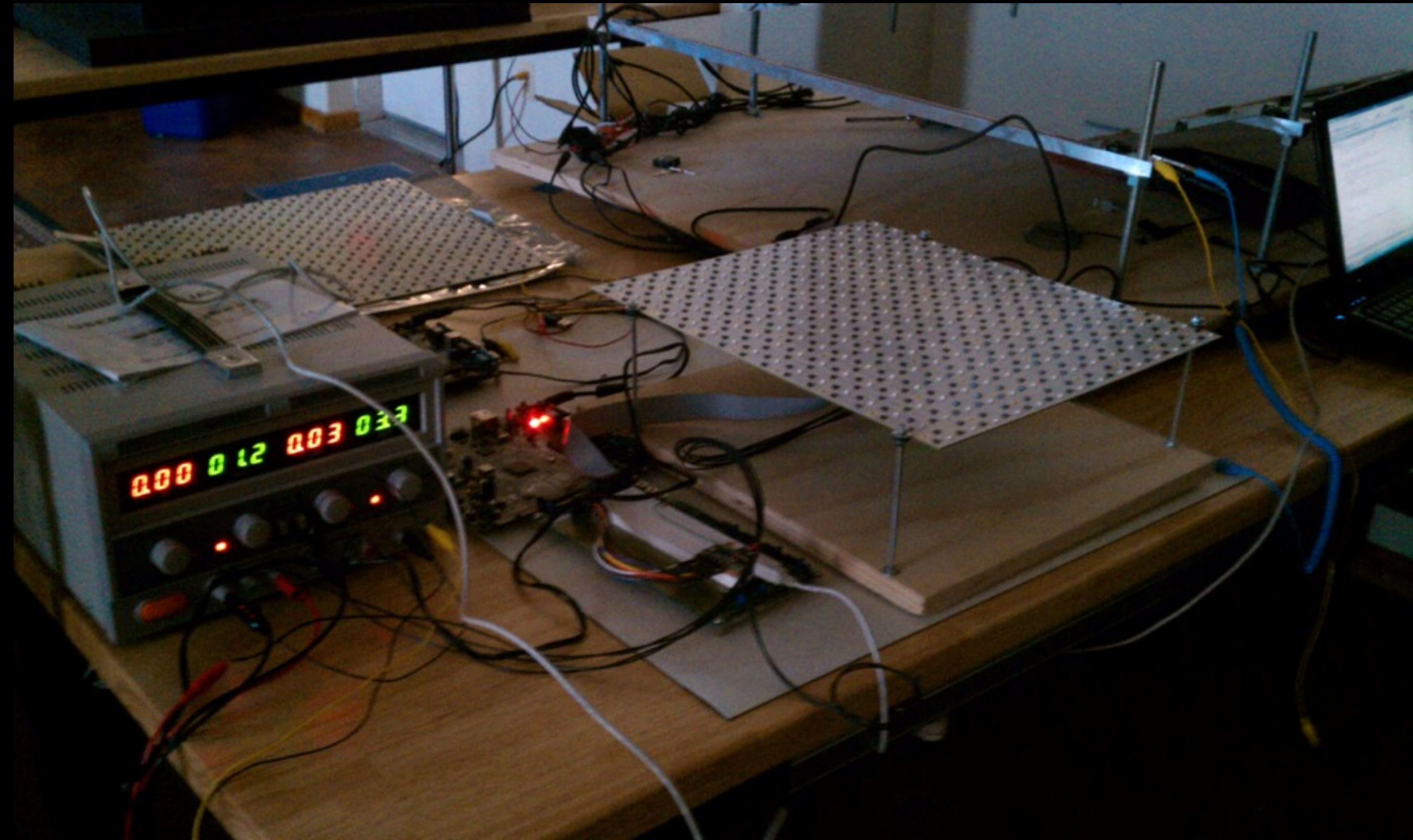
Capacitive Touch

Tablets to
(almost)
32" Screens

Questions or Thoughts about...

Case Studies

How the Tech Works - Projection, LCD, and various touch technologies...