Microsoft® Research
Faculty Summit 2010

The Surface in Creative Production Environments

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The Surface in Creative Production Environments

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Niko: Markie, the wood one sounds better. . .
Mark: But, but, you just *think* it sounds better

Proof! They just *think* it sounds better

Our second study investigated how metaphorical associations with weight affect decision-making. . .this time featuring a "social action survey" asking whether particular public issues should receive more or less government funding.. . Men allocated more money to social issues in the heavy condition (*M* = 4.00, SD = 0.72) than in the light condition (*M* = 2.50, SD = 2.12;

. . .we primed participants by the seat of their pants (*24*). Eighty-six participants sat in either a hard wooden chair or a soft cushioned chair while in negotiation task. . . We next calculated the change in offer prices from first to second offer. . .Among participants who made a second offer, hard chairs indeed produced less change in offer price (*M* = $896.5, SD = $529.6) than did soft chairs (*M* = $1243.6, SD = $775.9), *F*(1, 66) = 4.30, *P* = 0.042.

In our first study, testing influences of weight on impression formation, we had 54 passersby evaluate a job candidate by reviewing resumes on either light (340.2 g) or heavy (2041.2 g) clipboards (*19*). Participants using heavy clipboards rated the candidate as better overall (Table 1) [*F*(1, 52) = 4.08, *P* = 0.049] and specifically as displaying more serious interest in the position [*F*(1, 52) = 4.40, *P* = 0.041] (*19*). However, the candidate was not rated as more likely to "get along" with co-workers

Joshua M. Ackerman,[1] Christopher C. Nocera,[2] John A. Bargh[3] , Incidental Haptic Sensations Influence Social Judgments and Decisions, *Science* 25 June 2010

Oh. . . If they *act* like it sounds better, they just might make it sound better.

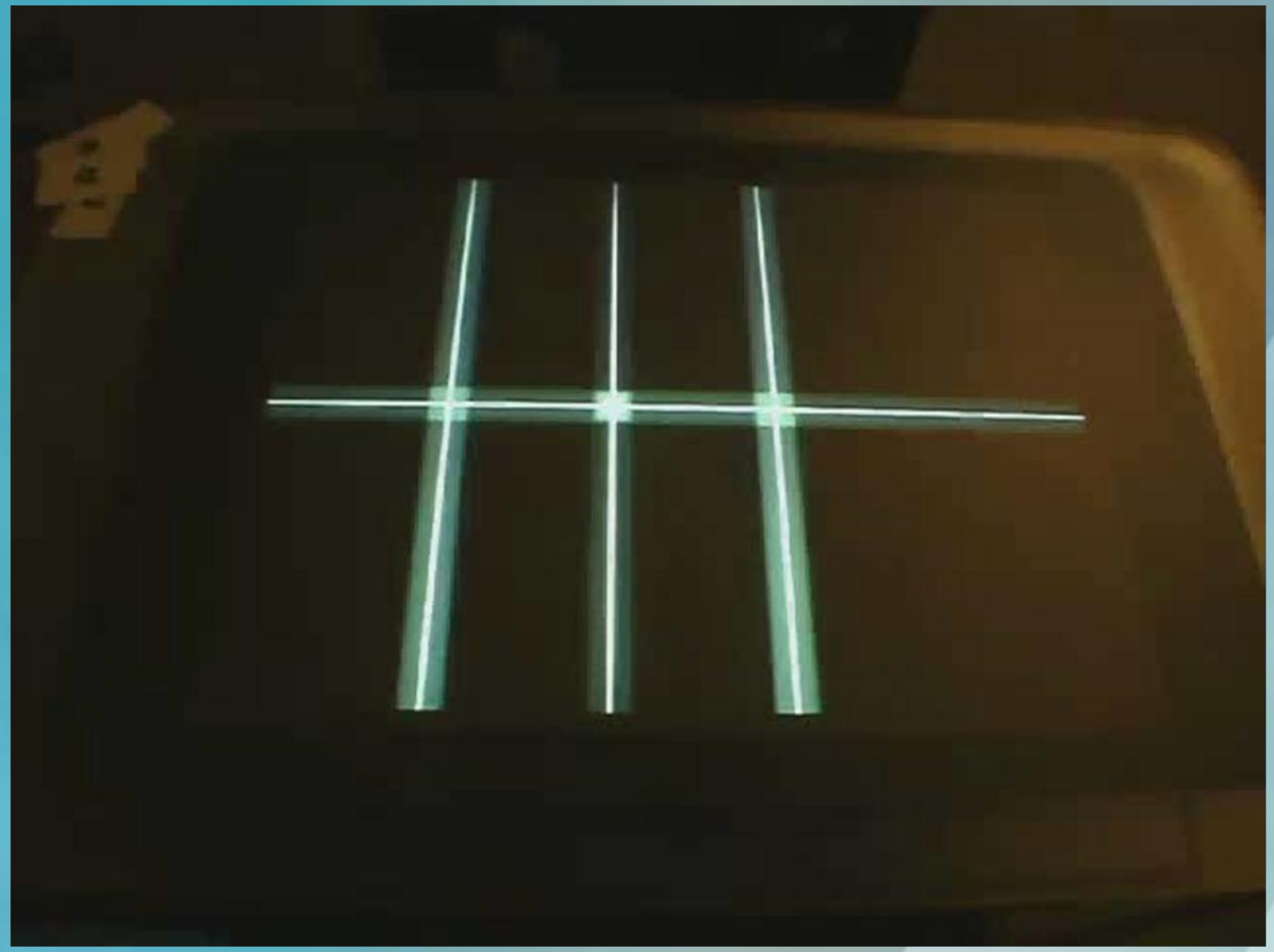
The Surface and the Recording Studio

"...the reason we use knobs in the physical world is not because they are the best way for people to interact with equipment, it is physical requirements of their function that dictates their form. With VR, the link between form and function can be severed."

Electronic Musician Magazine, July 1990

Challenge #1
Make a Better Knob

A Better Knob



Knob-Centric Viewpoint

Control Room

Logical Environment

Collaborative Environment

Social Environment

Acoustic Environment

Cognitive Demands are High

Individual
Physical – Set up gear, slide and twist knobs
Logical – Map signal flow, processing algorithms, editing sequences
Emotional – Receptive to and possibly match the feeling of the music

Group
Physical – Radiate body language, maintain eye contact
Logical – Comprehend and communicate patches, edits, etc.
Emotional – Sensitive to and possibly intervening in the session's mood

Video: Engineer and the 2nd Engineer are discussing how to record sound to an 8 track analog tape. A glimpse of a recording session environment.

Recording Sessions, more than a bunch of knobs

Engineer must be Present

Physical Presence
Logical Presence
Emotional Presence

Remain aware and ready to act on all levels

Good Interface = Effectiveness – Neediness

Neediness is the enemy of Presence

Goal:

Discover UI techniques that help users maintain presence.

The Surface is a perfect test platform

- Experiment with classic visual interfaces
- Move tasks to the body
- Social platform
- Flexible development environment

Creative Production Environments
5 challenges

• Make better knobs	LineQ
• Keep track of the mix	SurfLisp
• Keep me in the flow	MixUpp
• Help me with the patch	Wiggle
• Keep my eyes off the board	Furl

Challenge #2: Keep Track of the Mix

After lunch:

- “I can’t remember the name of the file”
- “I forgot to bring that disk”

Mixing

Drums

Drums + Bass -> Rhythm

Rhythm + Vocal + Guitar

Rhythm + (Vocal * Reverb) + Guitar -> Final

Put Some Slap on the Bass

Drums

Drums + Bass -> Rhythm

Rhythm + Vocal + Guitar

Rhythm + (Vocal * Reverb) + Guitar -> Final

(Bass * Eq)

Multiple Versions of Code & Data

Drums

Drums + Bass -> Rhythm

Rhythm + Vocal + Guitar

Rhythm + (Vocal * Reverb) + Guitar -> Final

Settings

Recordings

Mixes

(Bass * Eq)

Artist: “Let’s use the Slap from the last song”

Lisp, Anyone?

(Gain a (Fx a b c d e (Eq low mid high (MicPre in))))

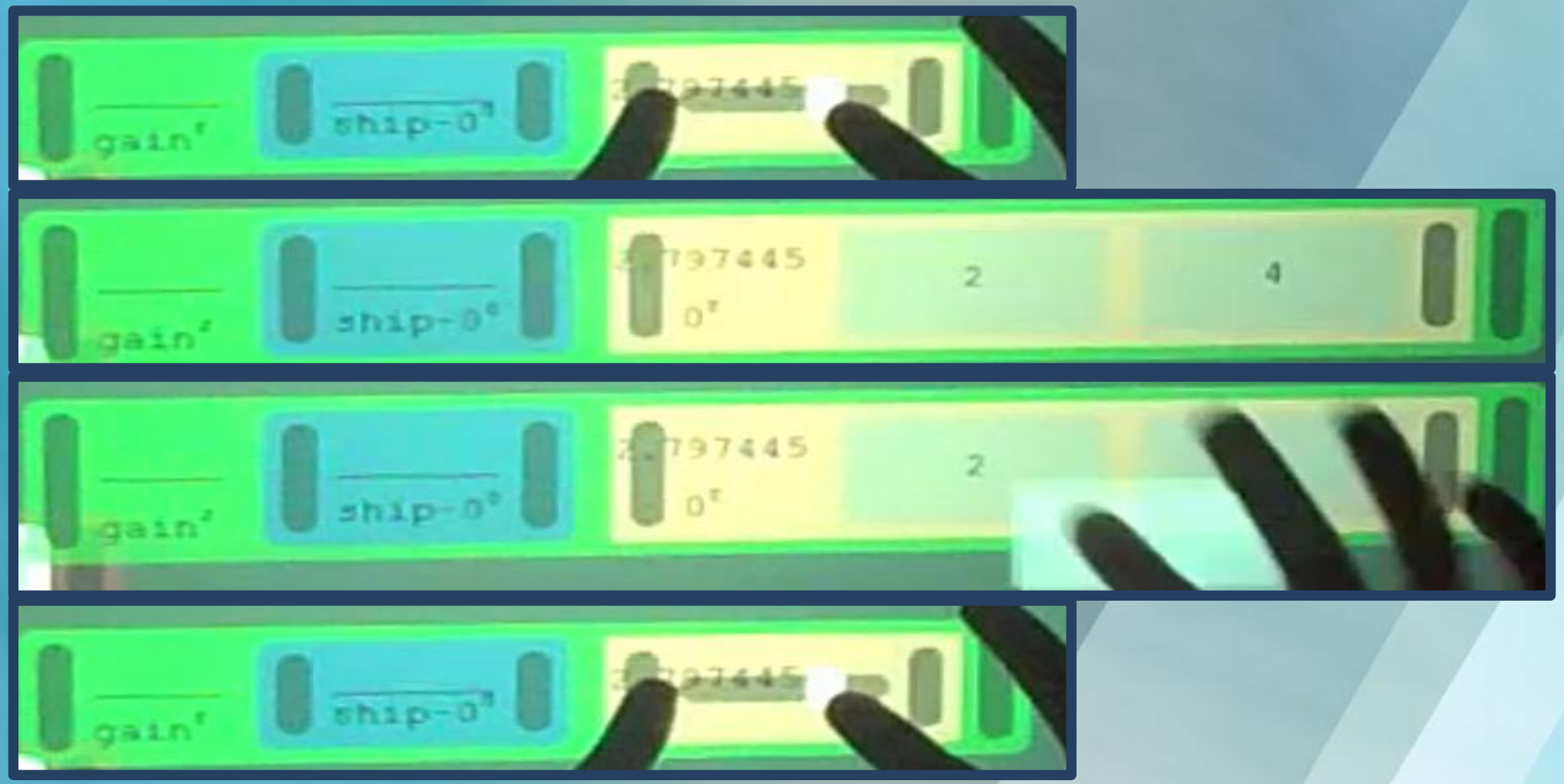
+ Inherently holds Data (music) and Code (the mix)
  in a modeless and persistent way

- Will produce unmanageably long lines of code

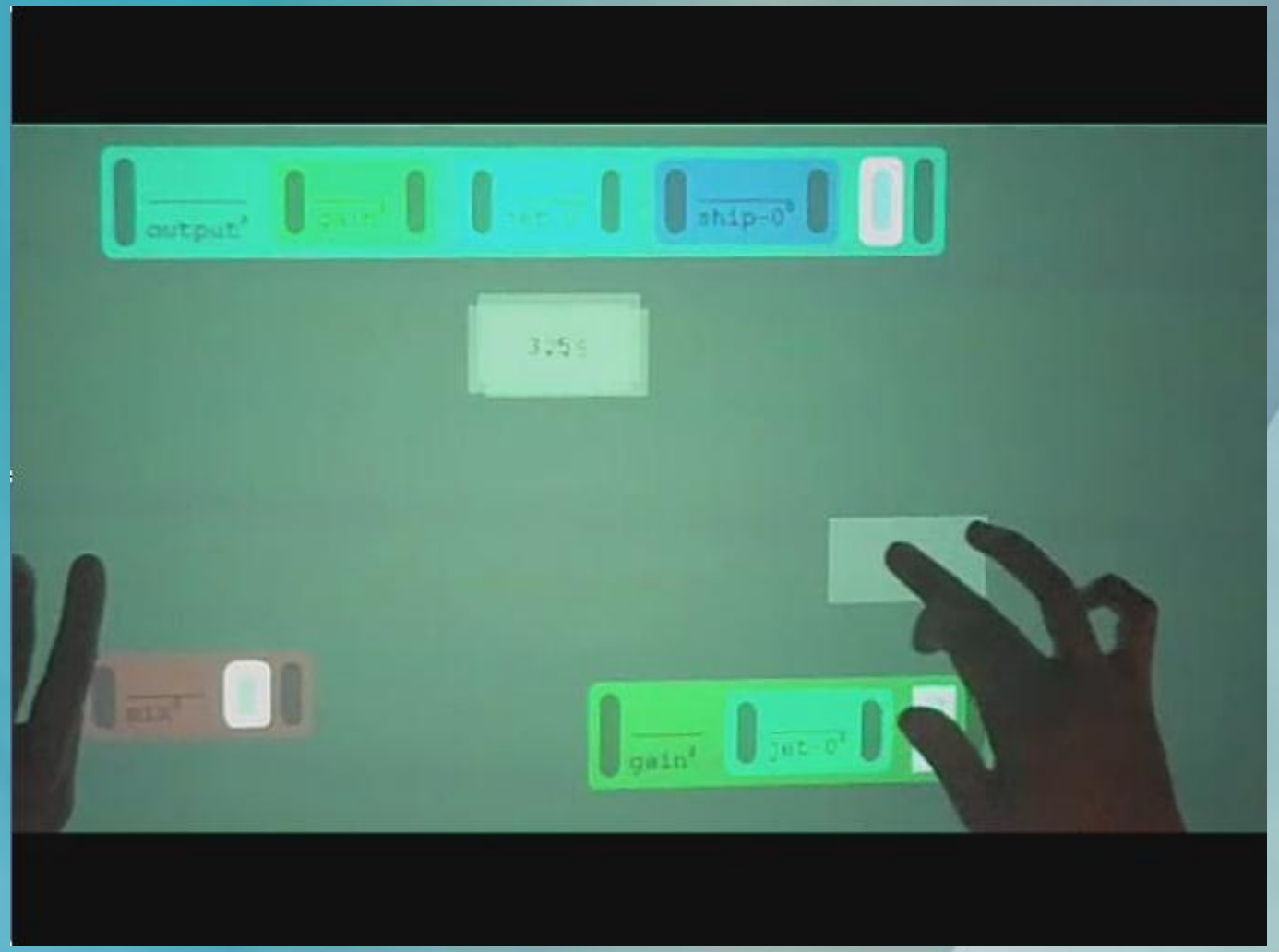
SurfLisp – A ‘Functional ZUI’

- Lisp-like syntax + ZUI-like interface
- Creates a ‘Functional ZUI’
  - Two-Hand Spread ~ expands parentheses
  - Two-Hand Gather ~ collapses parentheses
  - Not image zooming, but a type of REPL
  - Take ‘off’ via token, do not allow panning or click to zoom
- Optimizes Surface’s work area
  - Similar to mixing color on a palette

SurfLisp - Example



SurfLisp Video



SurfLisp - Conclusions

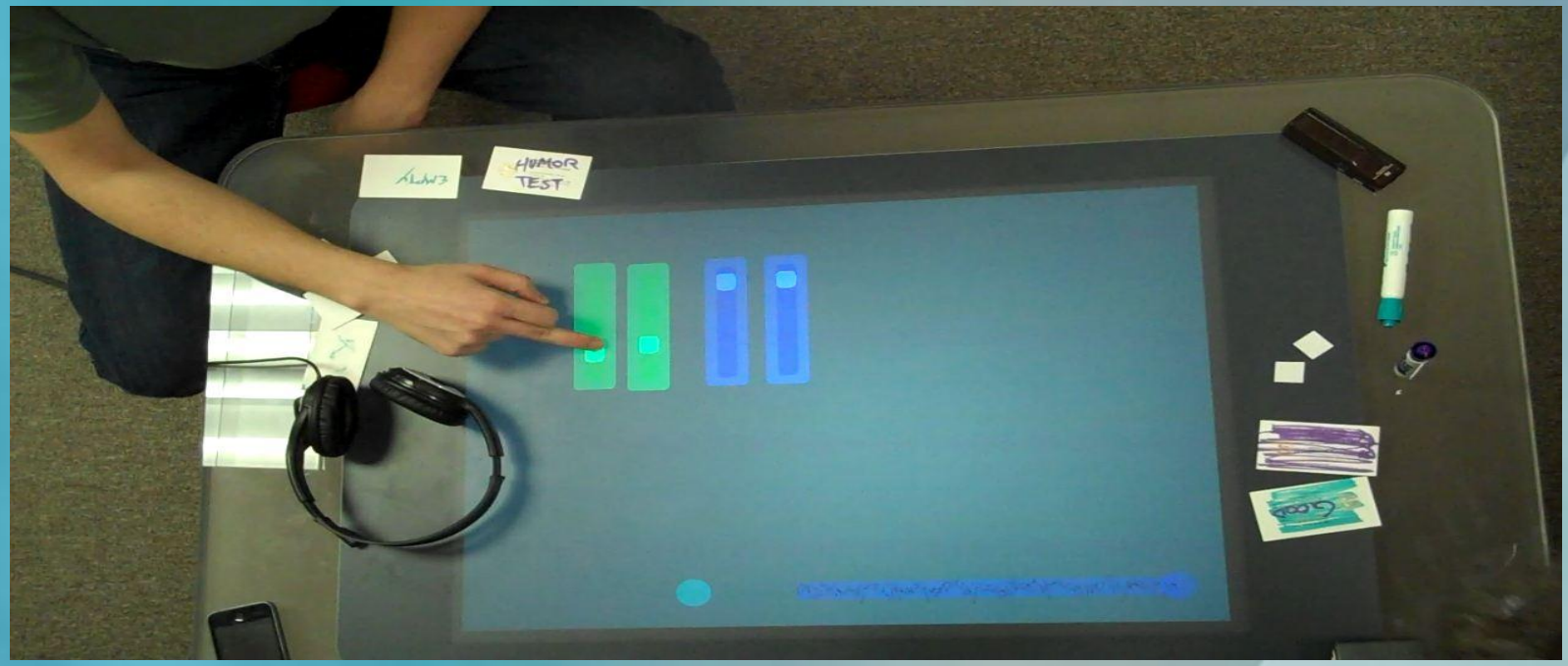
- Good:
  - Functional ZUI felt good, what is behind that number?
  - Potentially high effectiveness and agency
  - Potential mapping to existing DAW graphics
- Bad:
  - Problematic to operate in real-time
  - Signal routing / patching not elegant
  - Needy design: requires eye contact and precise picking

Video: commenting on the need for real time flow when working with Mr. Young

Challenge #3: Keep me in the flow

MixUpp – Looking toward live control

First Prototype: take SurfLisp's final controls and arrange them for real time control

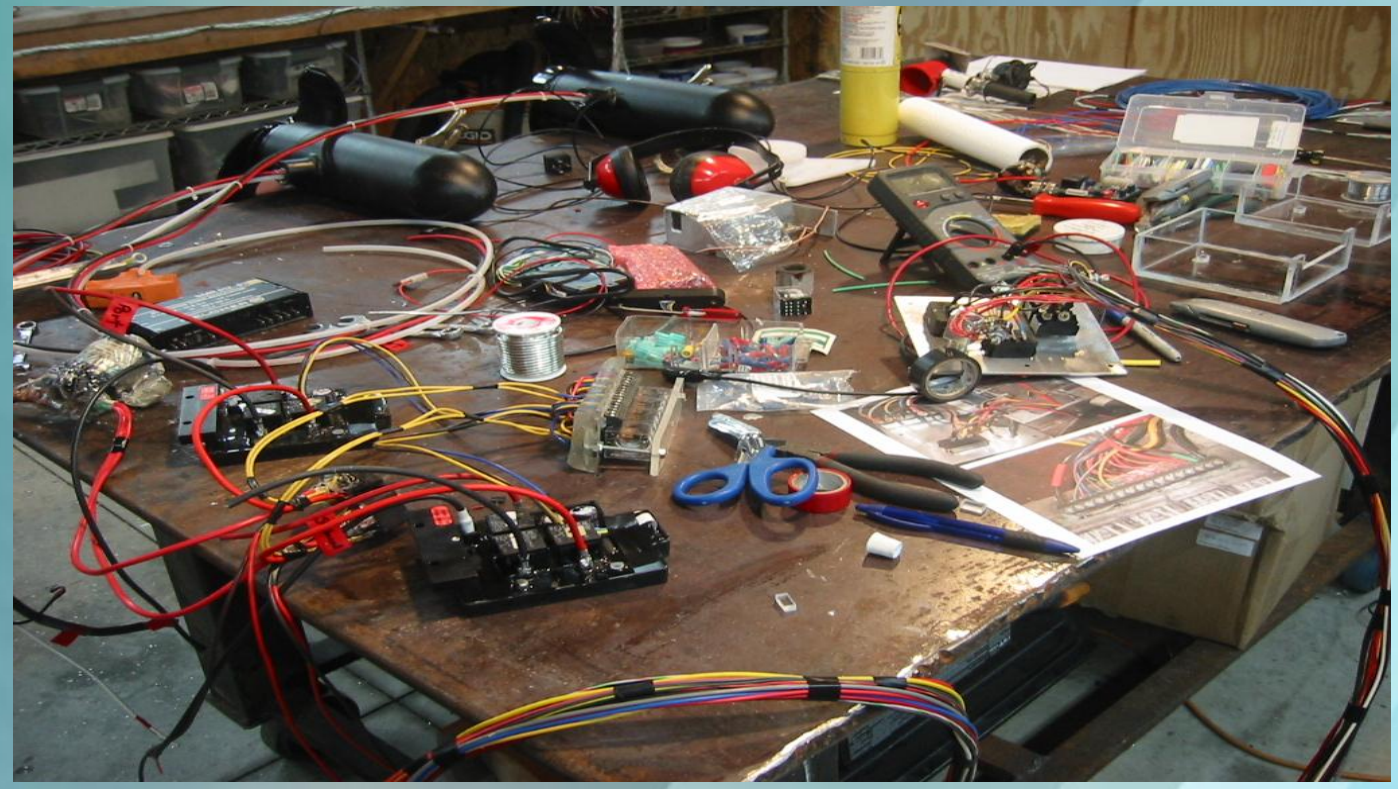


Video: user draws sound files as lines, and controls as lines that are orthogonal to sound lines.

Revised MixUpp Prototype

Messy Surface(s)

One reason the Surface is great is because it allows the design of ‘messy desks’



Messy Desks are Great for Dabbling

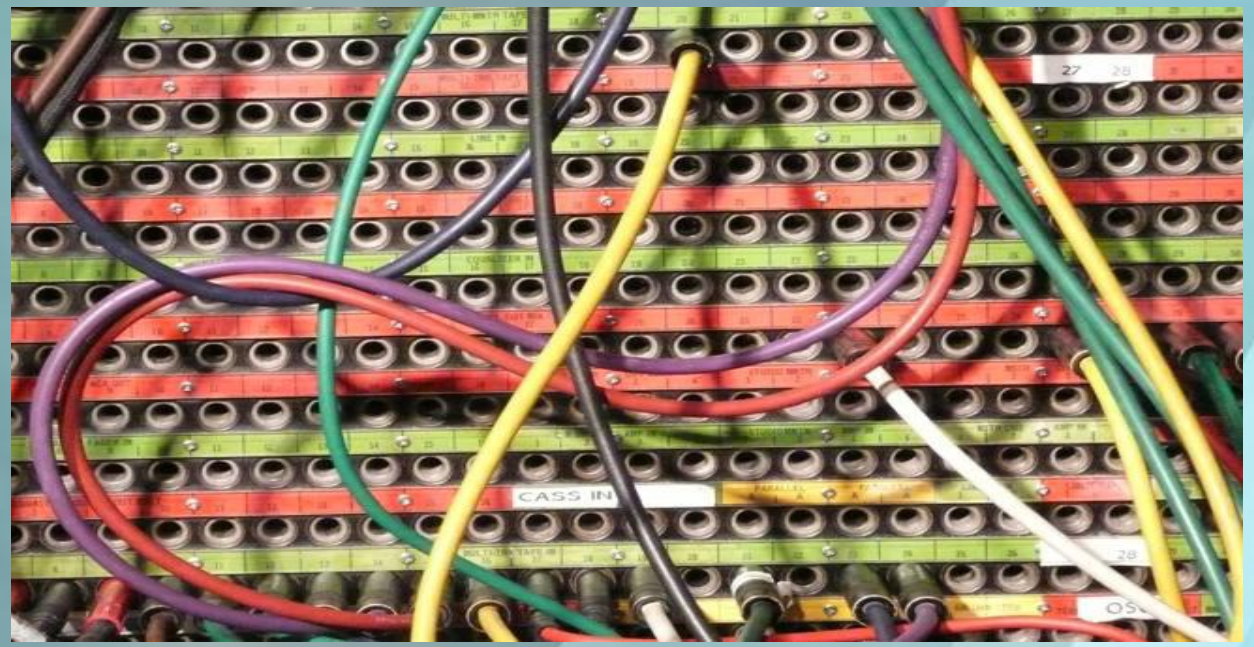
- Placement and Logic are User-Defined
    - Place meaning comes from the user
    - Emergence is possible: S control example
- Syntax Follows User's Thinking
    - Throw the mop down to me
    - Throw me down the mop
    - Mop
- Leverage User's Spatial Memory
    - Proprioceptive grounding of location
    - Nothing pops up or moves

Challenge #4:
Help me with the Patch

Complicated but:

User touches every node – programming the body to help remember location

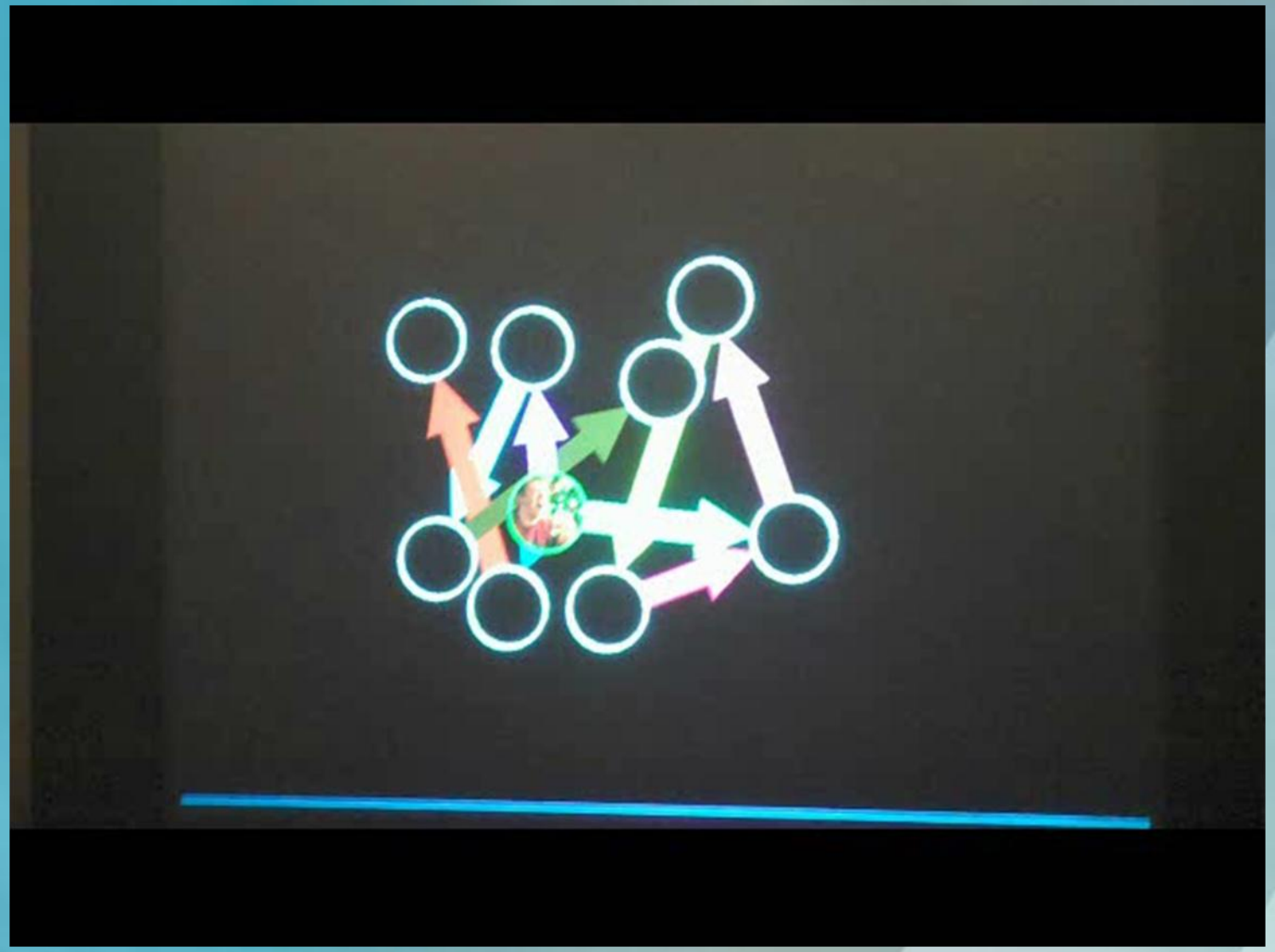
Wiggling allows route tracing



Video: Generalize the patch-bay model to the problem of tree structures, leverage Wiggle

Wiggle While You Work

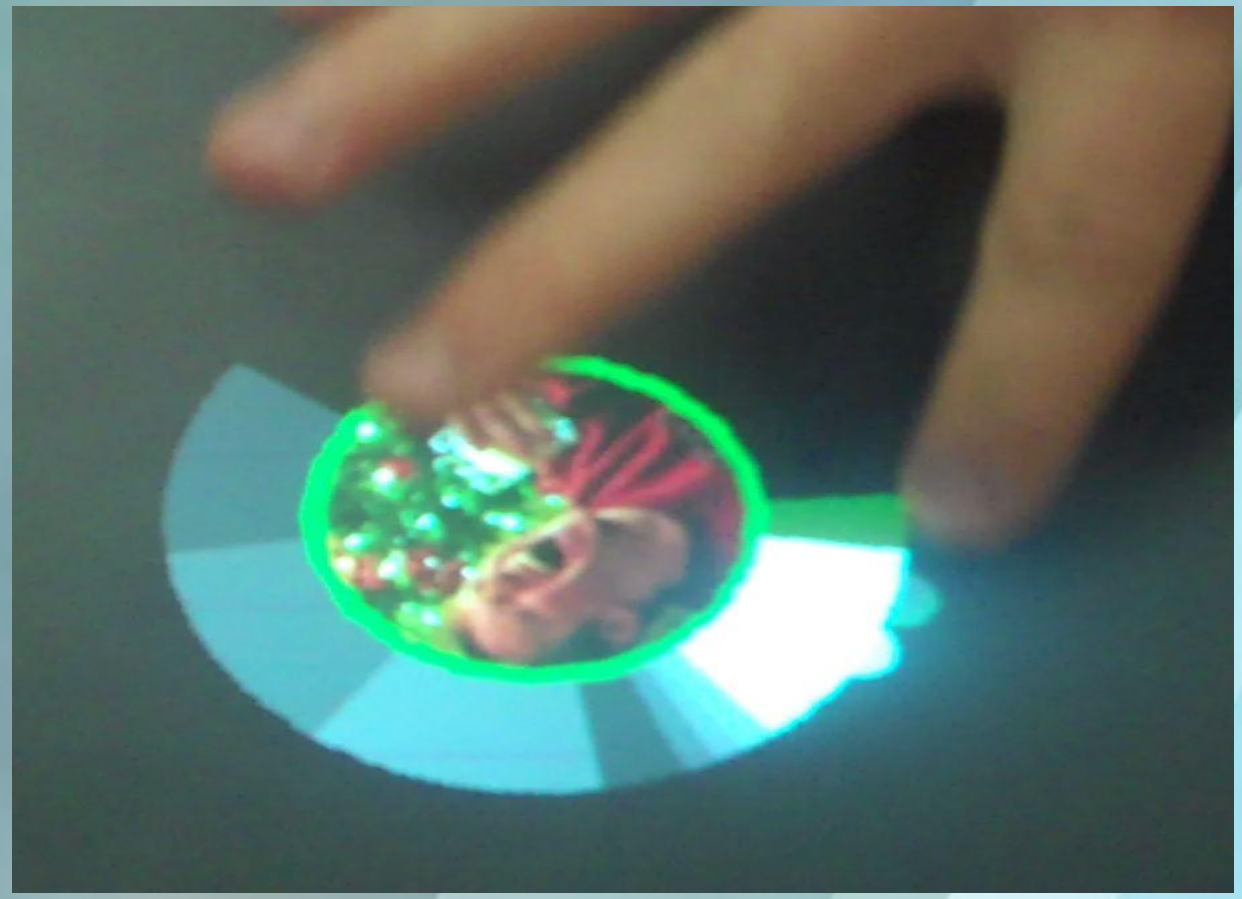
Proposed User Testing



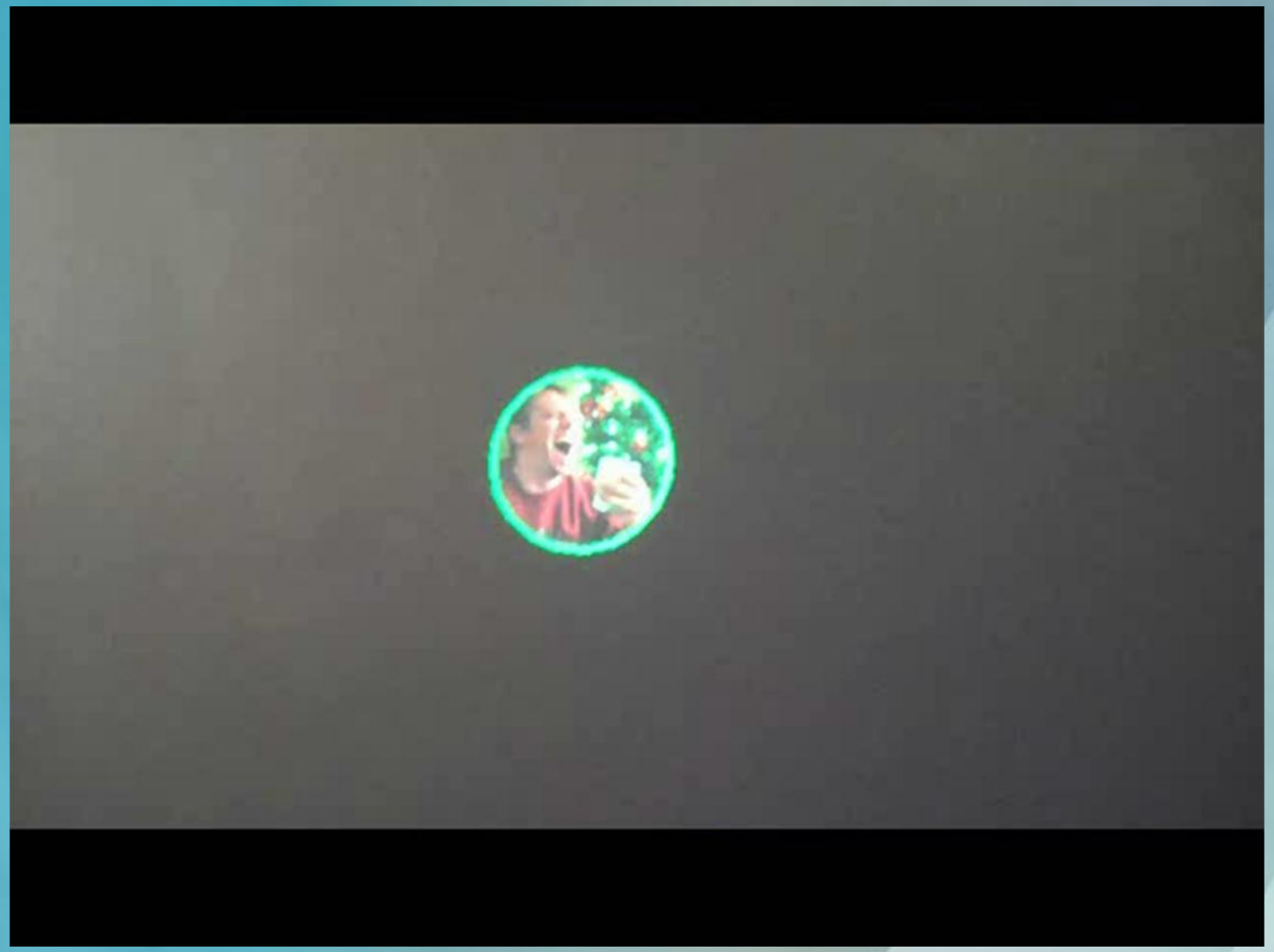
Challenge #5: Keep my eyes on the board

Leverage spatial memory to decrease eye contact

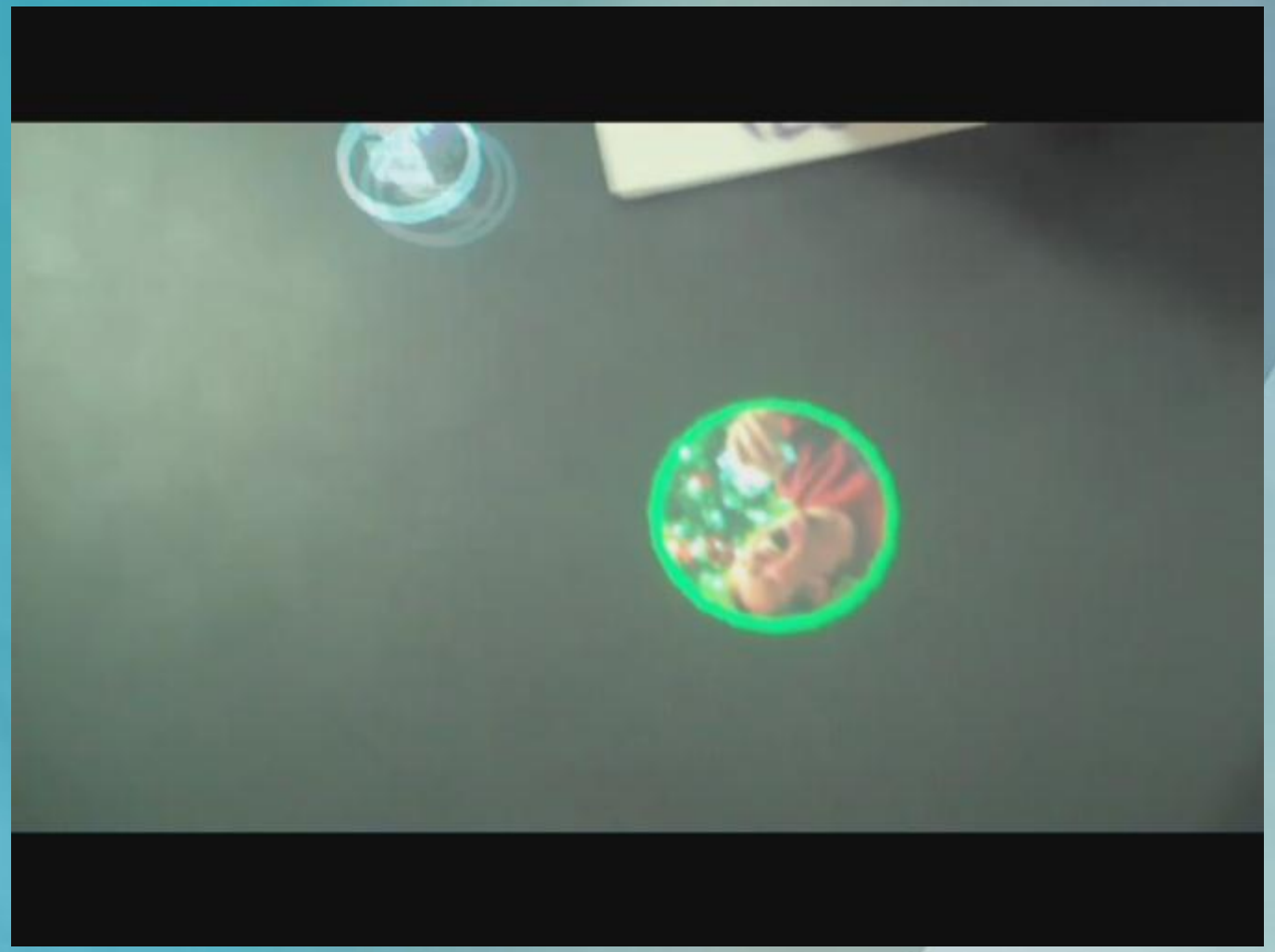
- Work in place for the pop- up via encircling
- Unfurl the menus



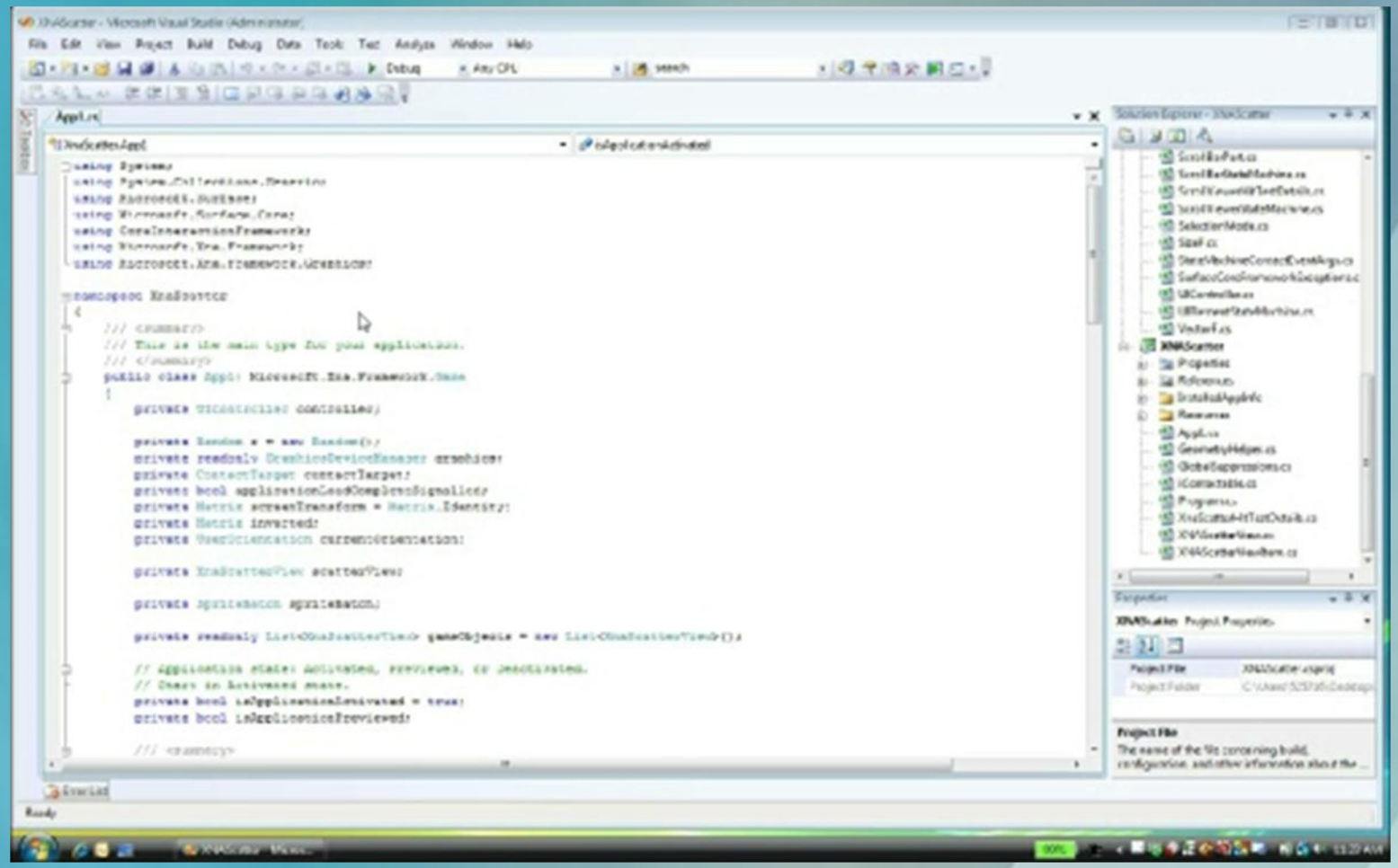
Furl



Wiggle & Furl



Wiggle on Windows7



Recap:

- Make better knobs
- Keep track of the mix
- Keep me in the flow
- Make the patch make sense
- Keep my eyes off the board

LineQ	|| = Less Passes
SurfLisp	Functional ZUI
MixUpp	|| allows alt Syntax
Wiggle	Manual Causality
Furl	Spatial Mapping

Prototype gesture and interface concepts

Our Rules

I put it there, you leave it there
Make tools, not collaborators - keep it dumb

- User must touch everything
- UI may move nothing (even zooms and pans)
- No pop-ups or interruptions, don't talk to me
- No dialog boxes or words to read
- No preordered sequence of operations or syntax

I will do it, you won't, don't touch it, don't interrupt me, don't even talk to me, look, just let me do it my way, hey, wait a minute, where are you going, I need a hand here?

The Surface can Make Magic

Agency
- I can do that?

Efficacy
- I did that!

Not Needy
- And it looked easy.

Work = Force * Distance
(Get the vector right but
cheat the magnitude)

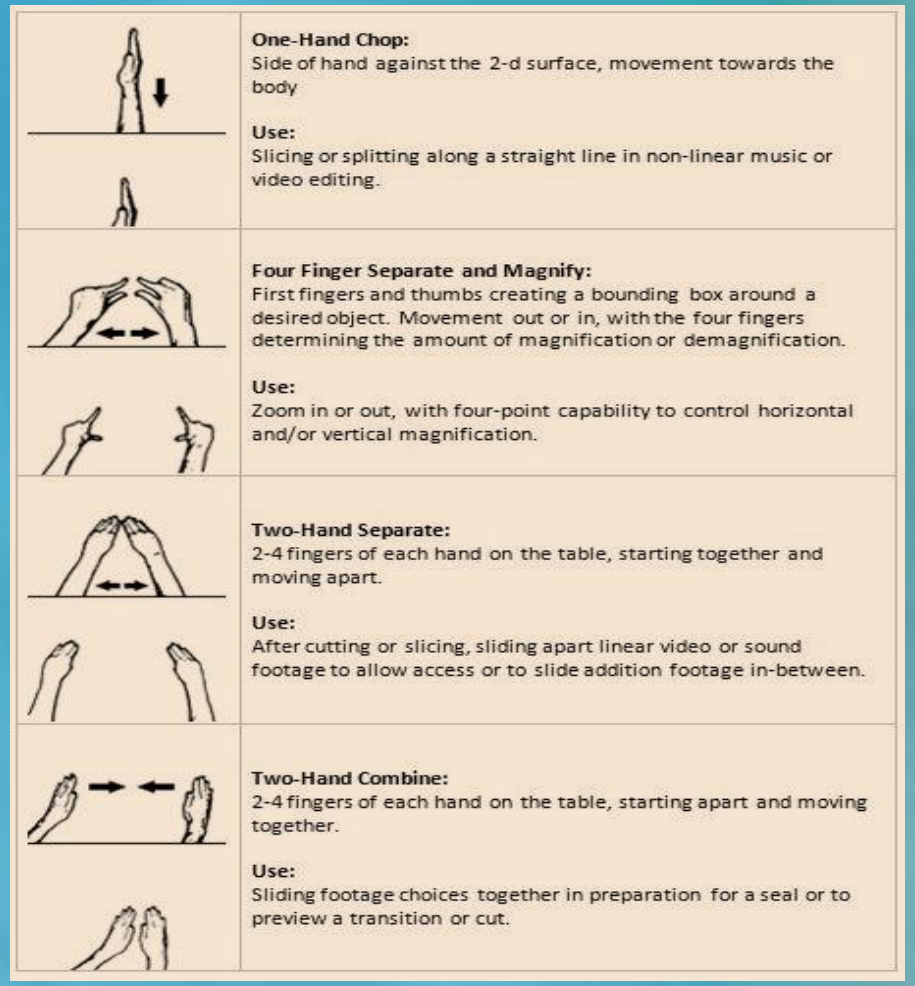
The Surface opens up new places

Knowing is inseparable from doing

- This project has been about ‘place’
- Situated Cognition informs *Situated Interface Design*
- Desktop metaphor only had to work in the office
- Mobile devices have to work in many situations
- The Surface operates as an ‘instrument’ to try new places

- The Surface is great, like a drug, & Microsoft is the dealer: the first one was free, but we had to buy the one for our NIH project!
- Using the Surface in Opthomology Waiting room for education: Because it is an *instrument* for UI experimentation.

The Surface is not a Tablet



One-Hand Chop:
Side of hand against the 2-d surface, movement towards the body

Use:
Slicing or splitting along a straight line in non-linear music or video editing.

Four Finger Separate and Magnify:
First fingers and thumbs creating a bounding box around a desired object. Movement out or in, with the four fingers determining the amount of magnification or demagnification.

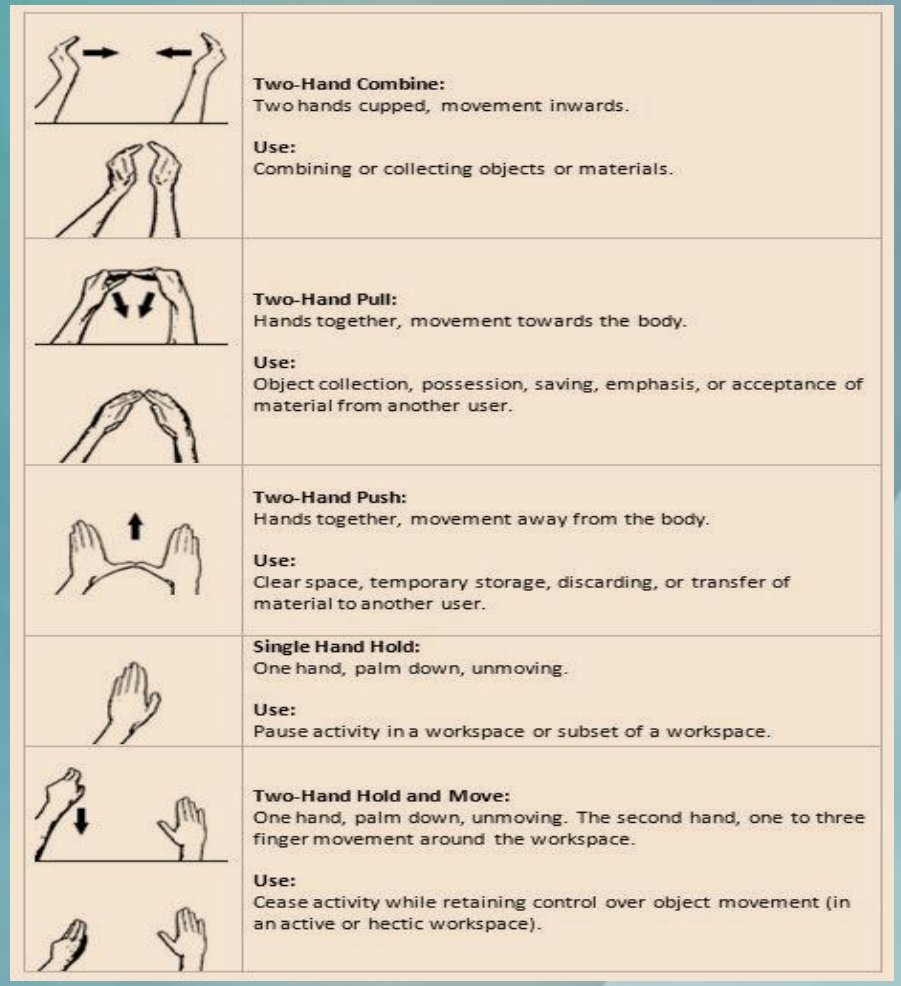
Use:
Zoom in or out, with four-point capability to control horizontal and/or vertical magnification.

Two-Hand Separate:
2-4 fingers of each hand on the table, starting together and moving apart.

Use:
After cutting or slicing, sliding apart linear video or sound footage to allow access or to slide addition footage in-between.

Two-Hand Combine:
2-4 fingers of each hand on the table, starting apart and moving together.

Use:
Sliding footage choices together in preparation for a seal or to preview a transition or cut.



Two-Hand Combine:
Two hands cupped, movement inwards.

Use:
Combining or collecting objects or materials.

Two-Hand Pull:
Hands together, movement towards the body.

Use:
Object collection, possession, saving, emphasis, or acceptance of material from another user.

Two-Hand Push:
Hands together, movement away from the body.

Use:
Clear space, temporary storage, discarding, or transfer of material to another user.

Single Hand Hold:
One hand, palm down, unmoving.

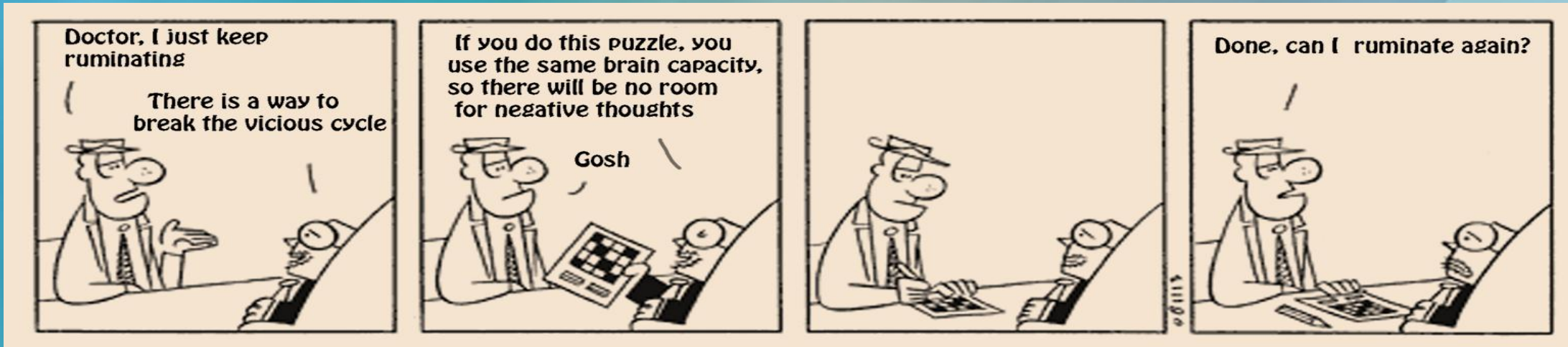
Use:
Pause activity in a workspace or subset of a workspace.

Two-Hand Hold and Move:
One hand, palm down, unmoving. The second hand, one to three finger movement around the workspace.

Use:
Cease activity while retaining control over object movement (in an active or hectic workspace).

- Two Hands
- Parallel Controls
- Multiple Control Points
- The Space can be Static
- Tangible Objects
- Body and Muscle

Cognitive Load, it ain't just for memory any more



Emotional Authoring requires Emotional Attention, Demand, Load

Video: Creative Production Environments led us to think about 'Emotional Load', interestingly the term Emotional Author was used in our first interview with Niko when we used a piece of foamcore as a stand-in for the surface.

Tools and Production Teams

Thanks

- Logan Olson, Joe Osborn – Annenberg Graduate Fellowships
- Mark Mine and Bei Yang at Walt Disney Imagineering
- David Krum, Emily Duff, Ryan Watterson
- Kedar Reddy, David Nelson, Diane Tucker, Evan Suma
- John Nordlinger, Lee Dirks, Harold Javid
- MSR

Starting Citations

Situational Cognition,
John Seely Brown, Collins, & Duguid, 1989; Greeno, 1989
Robbins, P. and M. Aydede, Eds, (2009), Cambridge Handbook

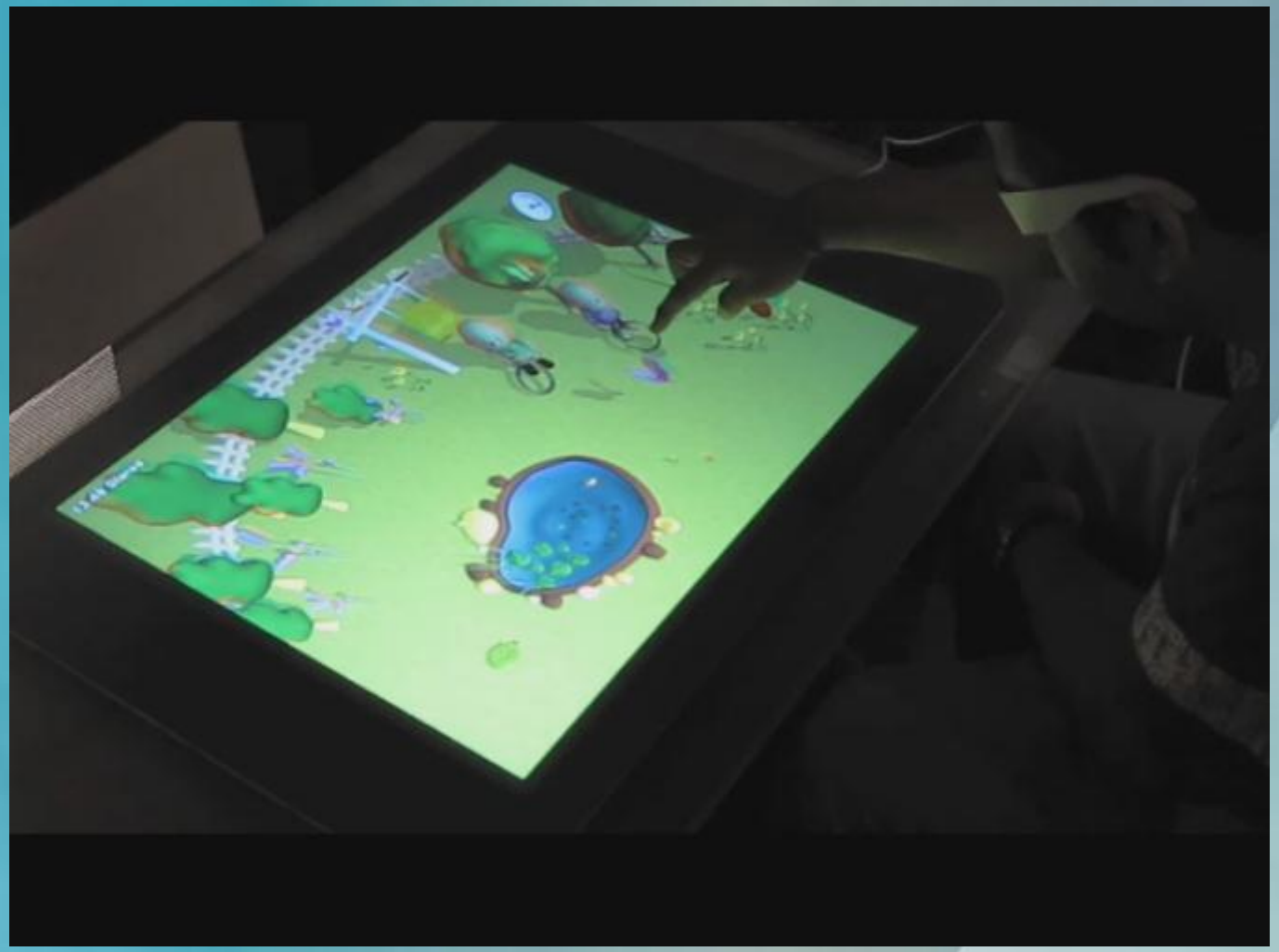
ZUI
Pad++, Ken Perlin, Jim Hollan, and Ben Bederson
Archy, Jef Raskin

Multitouch
Bill Buxton

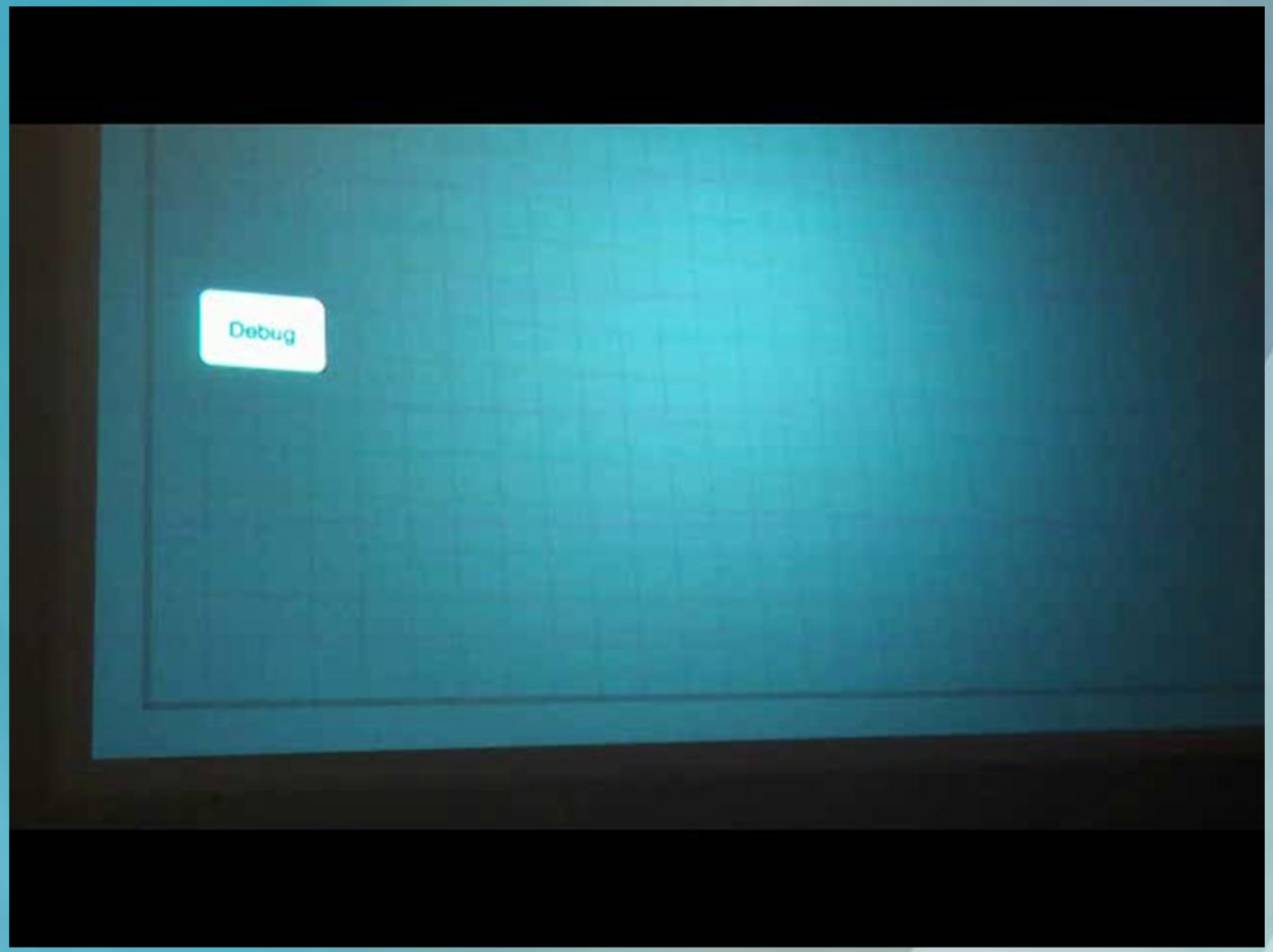
Spatial Memory
Tan, D. S., Pausch, R., Stefanucci, J. K., and Proffitt, D. R., CHI '02. ACM,

Thank You

NIH Project



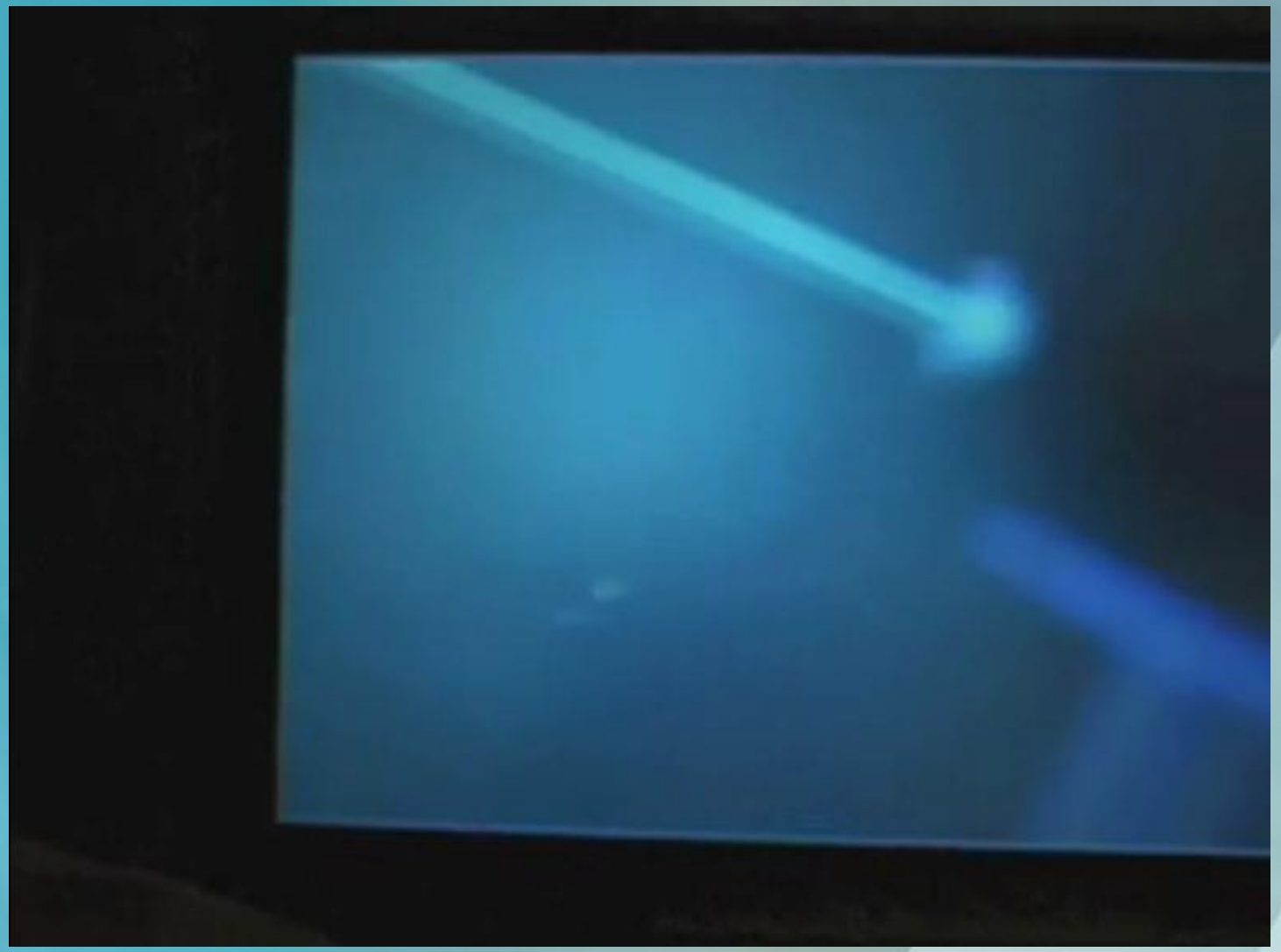
Unfurl & Trace



Slugherding

Building

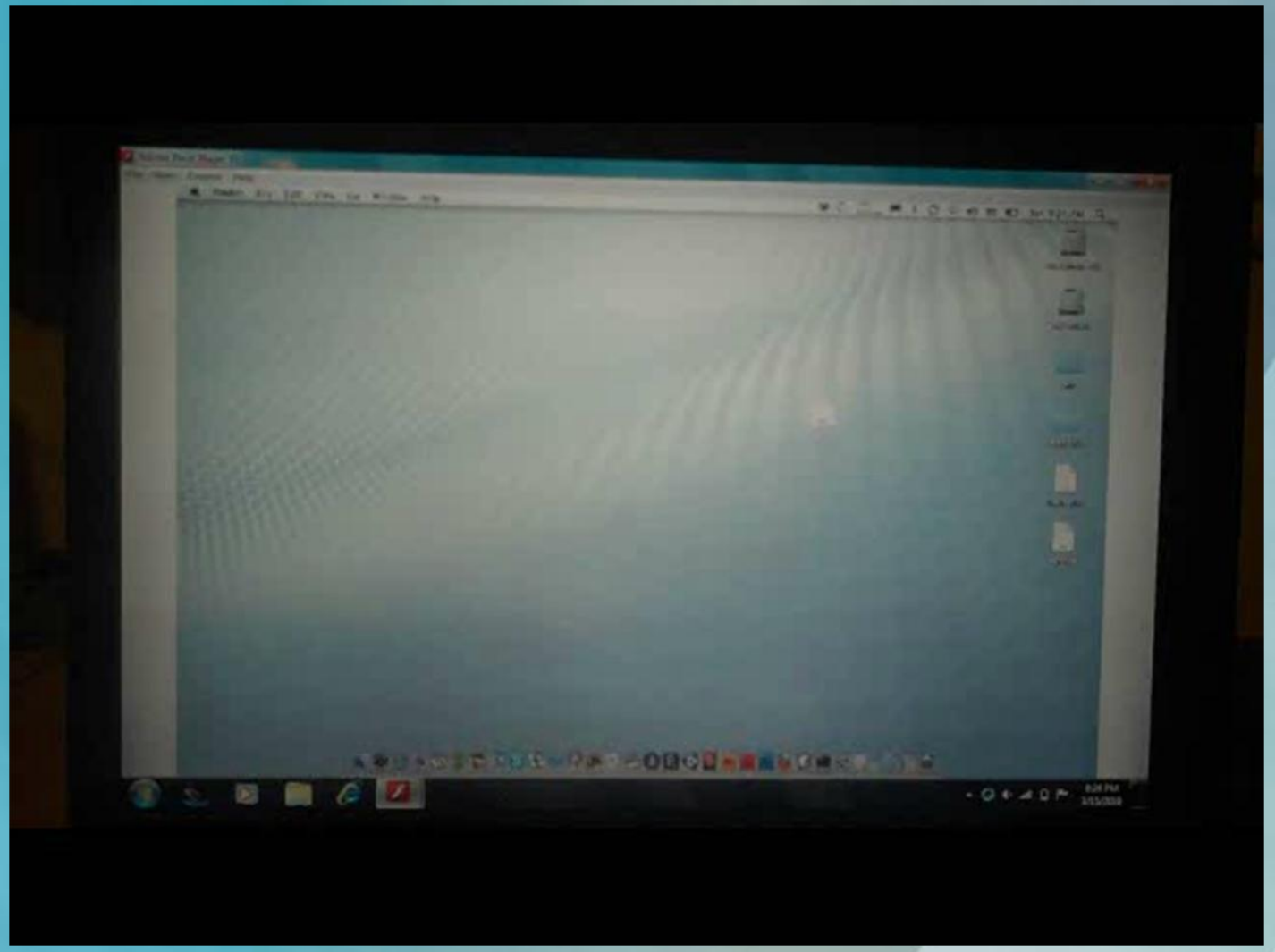
VideoEditing



Twitter


MxR
@touchPoetry: Collaborative creativity
using Twitter and the Microsoft Surface
THAT
JOE
HAT
TOUCH
THE
SNAKE
University of Southern California
Institute for Creative Technologies

Windows 7 & Tablets



Proposed Project Goals

- We will focus on two areas that are typically challenging in recording studios: Collaborative Mixing and Simultaneous Multi-Axis Control. Our design process will be iterative – we will test and change our approach based on input from identified partners in a professional mixing environment. Ideally, this will result in the discovery and fine-tuning of radically new gestures and interface models that are new both to the Surface and to recording studios. Windows 7 Multitouch will likely be embraced by vendors of existing digital audio workstations – when this happens, we would like to be ready with new interface ideas that put Multitouch ahead of the pack and brand Surface as the ultimate interface. Additionally, it is hoped that such work will be generally useful for signal processing and non-linear editing in other domains.
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-

- In a live evaluation loop and need to judge
- the artifac in an interative way where you
- are searching the space and you need fast
- ways to search the space, need highly evel
- capabilitys of manipulating process –

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