Microsoft Research
Faculty Summit 2010

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
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 ($M = 2.50$, $SD = 2.12$; $F(1, 52) = 4.08$, $P = 0.049$). However, the candidate was not rated as more likely to "get along" with co-workers.

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 ($F(1, 52) = 4.08$, $P = 0.049$) 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.

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Joshua M. Ackerman,¹ Christopher C. Nocera,² John A. Bargh³, 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 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."

Challenge #1
Make a Better Knob
A Better Knob
Knob-Centric Viewpoint
Control Room
Logical Environment
Collaborative Environment
Social Environment

Dealer
Producer
Artist
Wife
Ex Wife
2nd Engineer
Engineer
Acoustic Environment

Room Acoustics

12 + Microphones

Control Room

Drummer

Amps and Mics

Guitar Player
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 2\textsuperscript{nd} 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

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 - 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
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

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

- 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
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• MSR
Starting Citations


**ZUI**
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Archy, Jef Raskin

**Multitouch**
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Thank You
NIH Project
Unfurl & Trace
Slugherding
Video Editing
Twitter

MxR @touchPoetry: Collaborative creativity using Twitter and the Microsoft Surface

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.

• Pasted from <file:///C:\___000\___My_Docs\microsoft\surface-proposal\surface-bolas-final-compressed.doc>
• In a live evaluation loop and need to judge
• the artifact in an interactive way where you
• are searching the space and you need fast
• ways to search the space, need highly elevated
• capabilities of manipulating process –