Tactile Animation by Direct Manipulation of Grid Displays

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http://oliverschneider.ca/tactile-animation
HaptiMoto
Prasad et al 2014
Tactile Brush
Israr et al 2011
FeelCraft
Schneider et al 2014
TactiPEd
Paneels et al 2013
Agenda

1. Motivation

2. Tactile Animation

3. Evaluation

4. Applications
Tactile Animation

(a) Animate

(b) Render

(c) Display
Linear: $A_i^a = a_i \times A_v$

Log: $A_i^b = \frac{\log a_i + 1}{\log A_{\text{max}} + 1} A_v$

Power: $A_i^c = \sqrt{a_i} \times A_v$
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Evaluation

- 6 participants (5 animators)
- 3 tasks:
  - “Heartbeat”
  - “Turn Left”
  - “Match Sound”
Animation Metaphor

All participants finished all training, tasks, and a post-interview in an hour.

“This is totally animation” (P2)

“It felt very much like an animation tool” (P4)
Animation Objects vs Vector Sensations

“After using the new object I’d probably never use vector again.” (P2)

“If I weren’t an animator I think I would only use [animation objects].” (P4)

“You can control multiple [actuators] at the same time, so you don’t have to create new objects and then put them everywhere on the screen.” (P1)
Direct Manipulation

“I would …just play around with [the animation object] before creating the animation, as a way to pre-visualize what I was going to do.” (P5)

“I kind of play around with it, and randomly come up with the ideas.” (P6)
Replication

- Copy/paste (P1-3,5,6)
- Both time and space
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Tactile Animation

• Enables continuous, direct manipulation through 2D interpolation
• Accessible, powerful metaphor for haptic design
• Potential to generalize to different devices
Future Work

• Scaling tactile animation and Mango to VR, AR
• New techniques for haptic design
• Building content for new immersive experiences
Thanks! Check out our demo

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