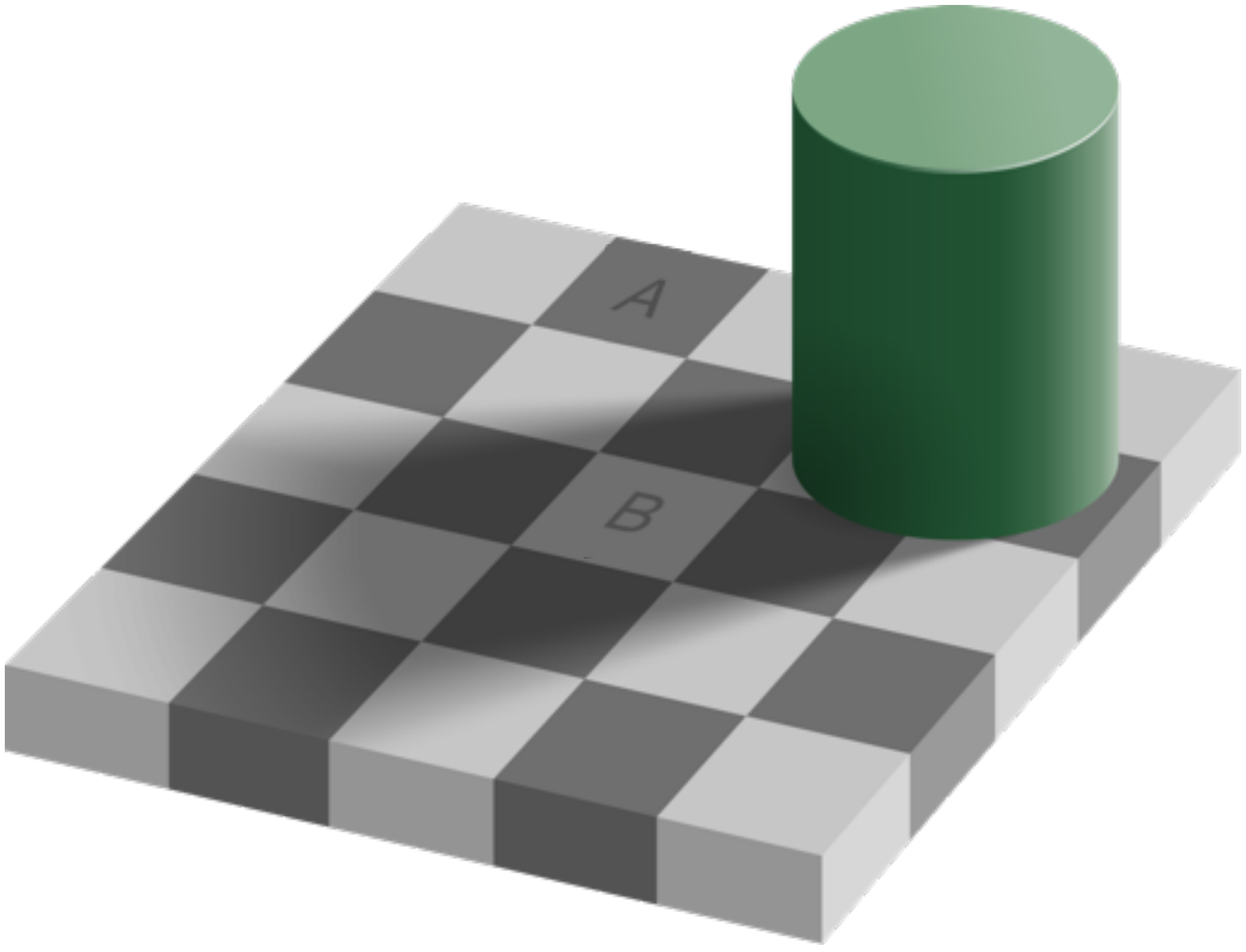
ME 327: Design and Control of Haptic Systems
Spring 2020

# Interactive Session 6: Haptic Illusions

Allison M. Okamura
Stanford University

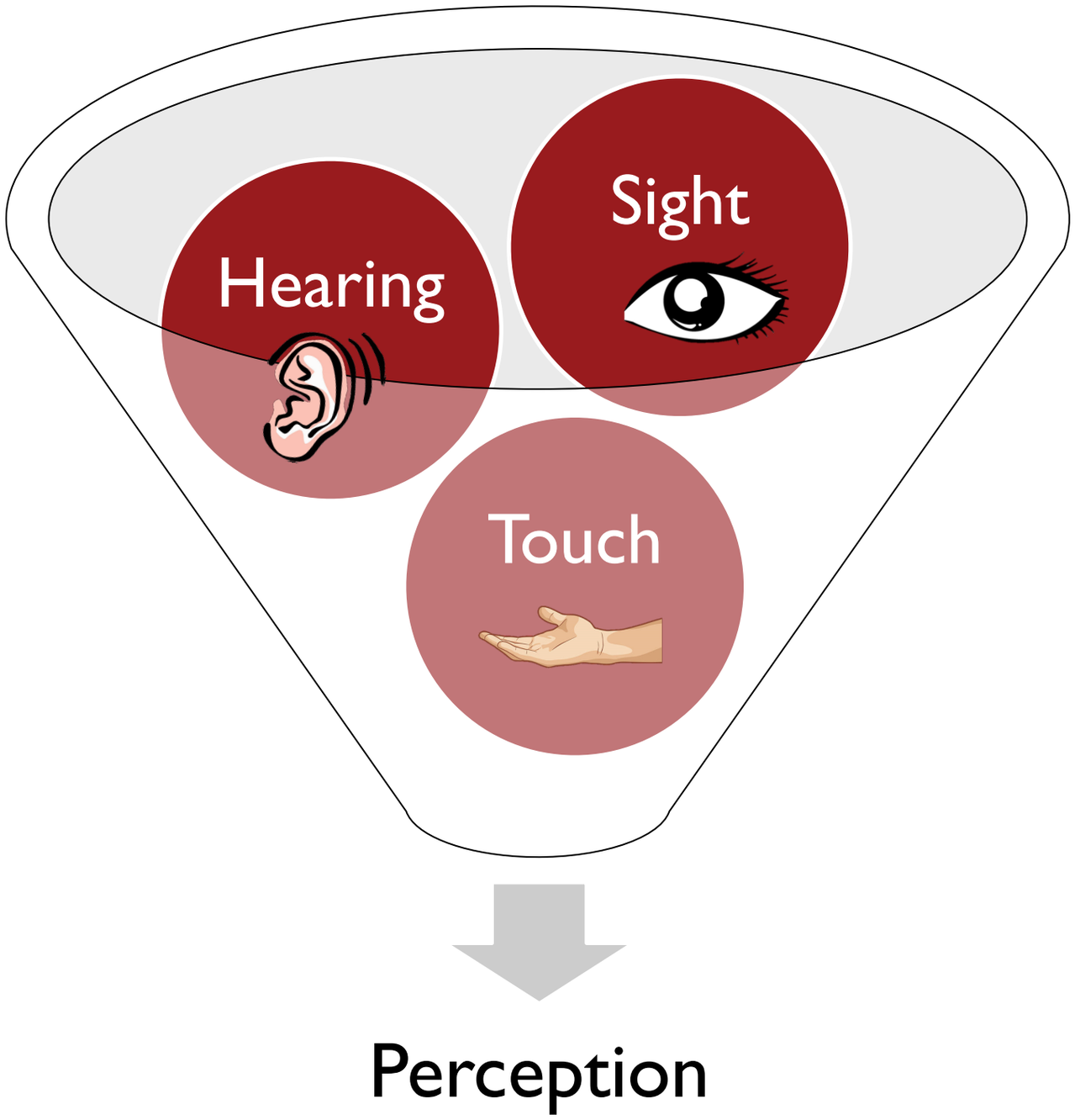
# Visual Illusions




Adelson, E. H., 2000, 'Lightness Perception and Lightness Illusions', in The New Cognitive Neurosciences, M. Gazzaniga (Ed), 2nd ed. pp. 339-351, MIT Press: Cambridge MA.

# Haptic Illusions



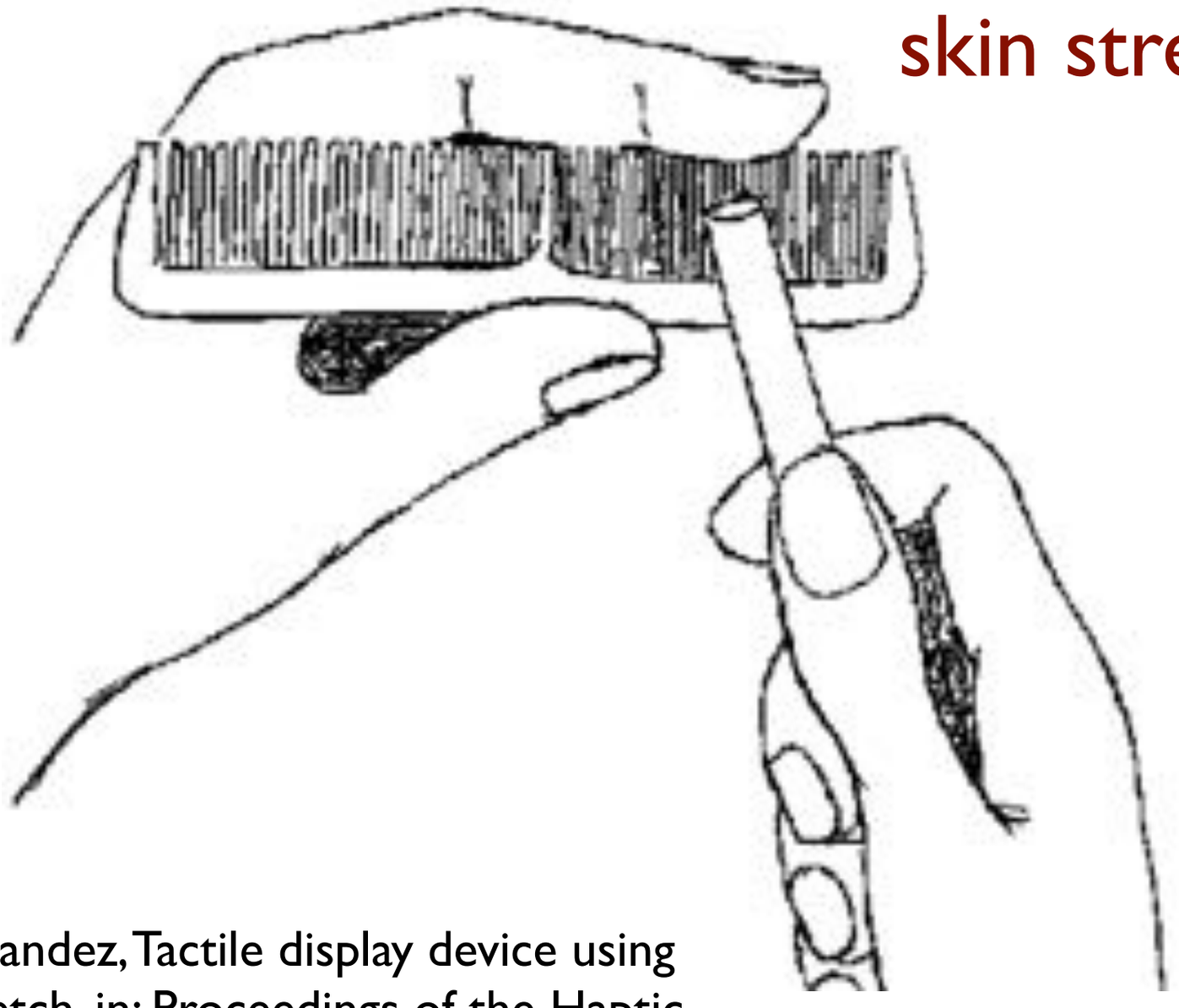

A great paper:

Hayward, V (2008). A brief taxonomy of tactile illusions and demonstrations that can be done in a hardware store. Brain Research Bulletin 75(6): 742-752.

Slide courtesy Heather Culbertson (USC)

# Comb Illusion

skin stretch!



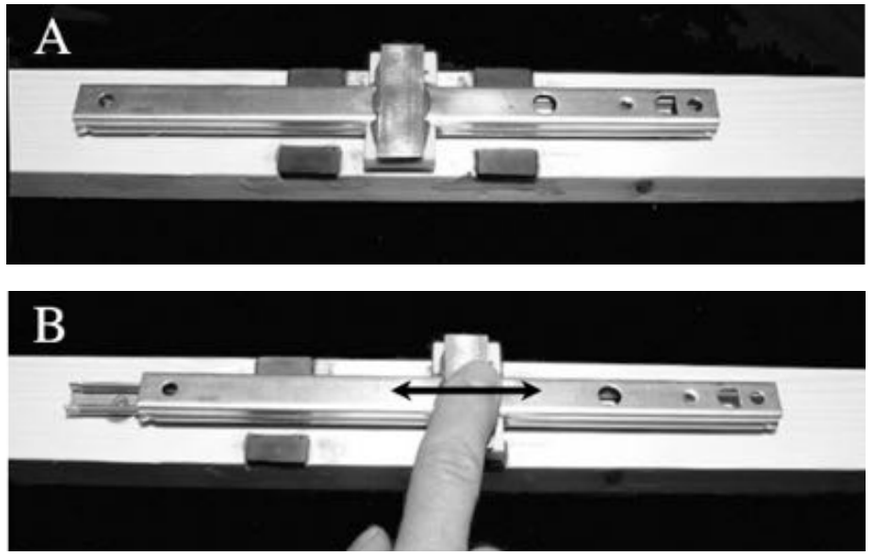
V. Hayward, M. Cruz-Hernandez, Tactile display device using distributed lateral skin stretch, in: Proceedings of the Haptic Interfaces for Virtual Environment and Teleoperator Systems Symposium, Vol. DSC-69-2, ASME, 2000, pp. 1309–1314.

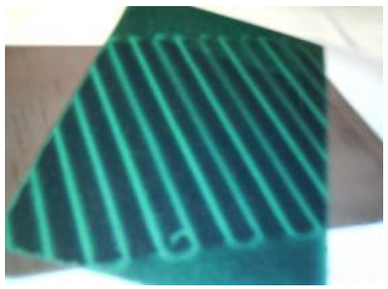
# Fishbone Tactile Illusion


Nakatani, Masashi, Robert D. Howe, and Susumu Tachi. "Surface texture can bias tactile form perception." *Experimental Brain Research* 208.1 (2011): 151-156.

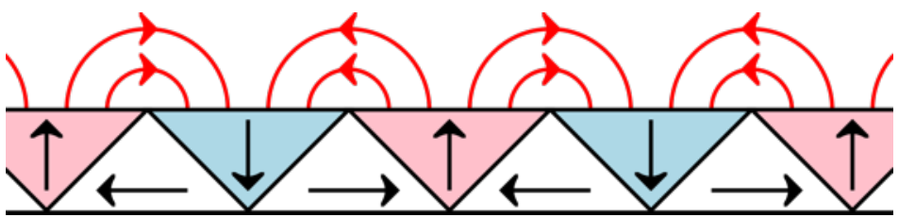
 

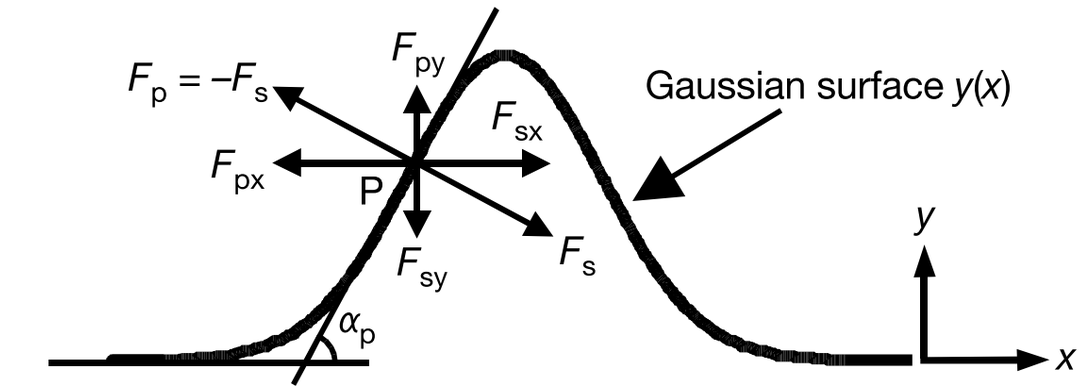
# Bump and Hole Illusions

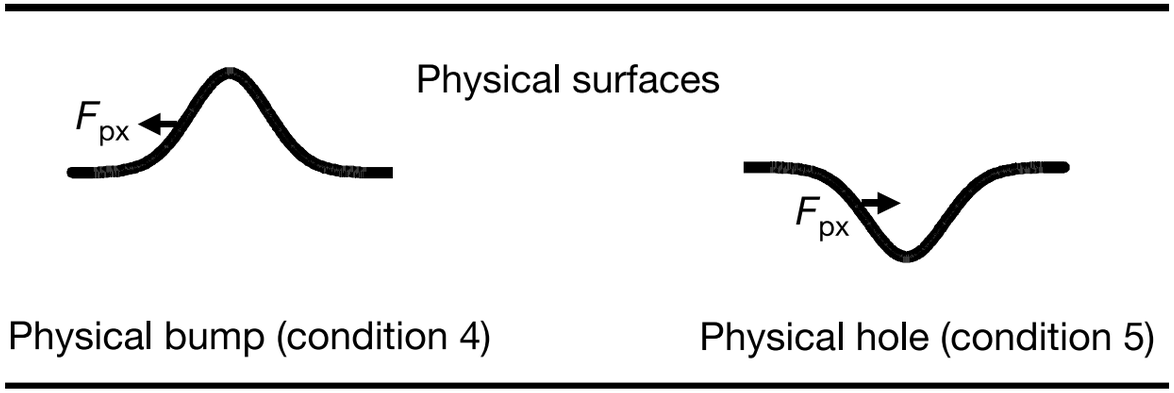


Refrigerator magnet polarization



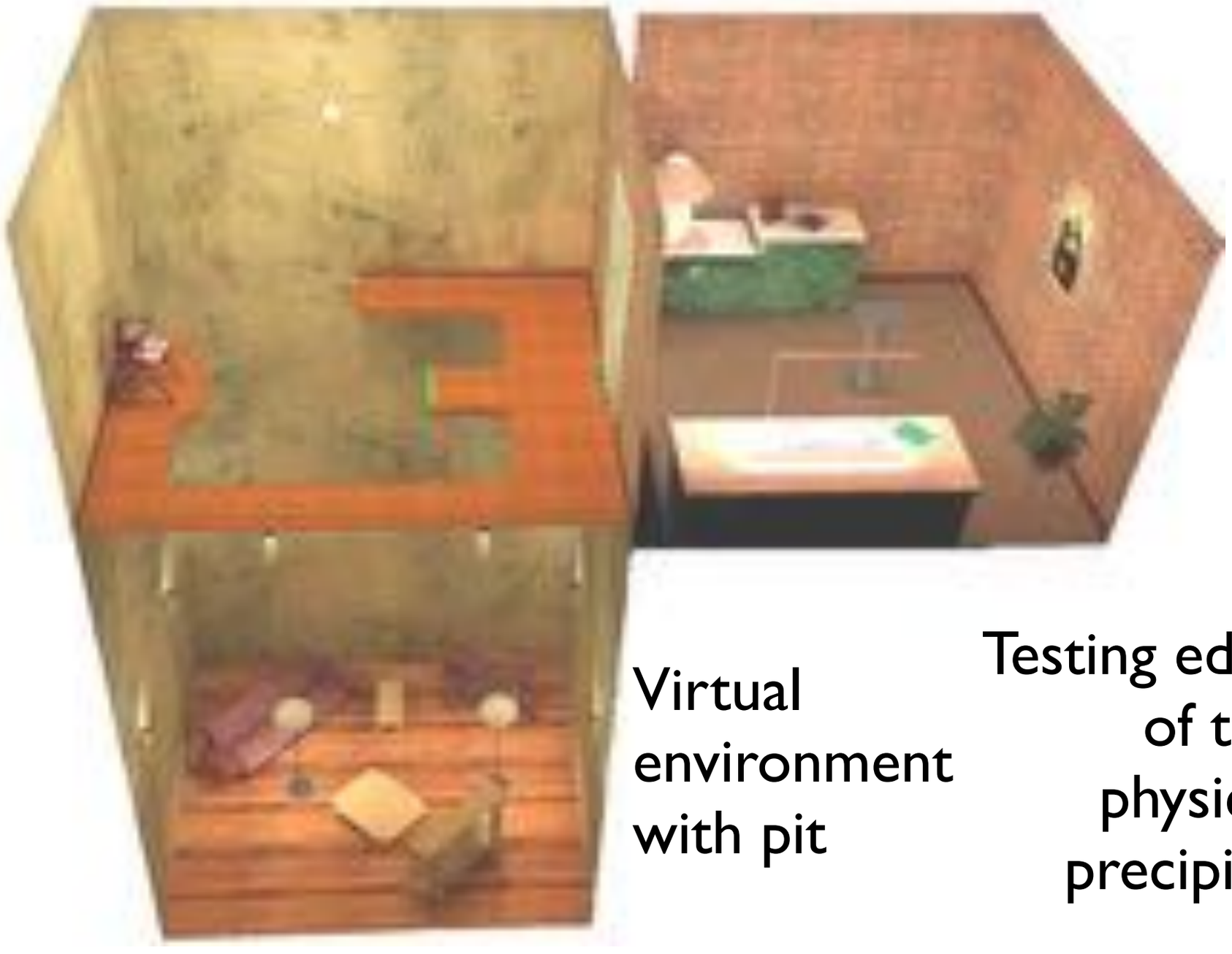



G. Robles-De-La-Torre, V. Hayward, Force can overcome object geometry in the perception of shape through active touch, Nature 412 (2001) 445–448.

# Passive Haptics



Virtual environment with pit

Testing edge of the physical precipice

Brent Insko Ph.D. Dissertation, UNC Chapel Hill Computer Science 2001

Yet another weight illusion:

# Barbie-Cueing Weight Perception

"Conceptual knowledge, in the form of culturally reinforced biases, seems to affect how we perceive… weight.'"

- *Saccone and Chouinard i-Perception 2019*

Reminders:
Assignment 2 due today
Add/drop deadline tomorrow
Assignment 3 to be posted today (no late submissions allowed due to posted solutions)

Quiz 1 plan: 60 minutes,
taken online any time on Friday, May 1

Office Hours/Q&A with Allison until 10 am.
Question queue (see tab with today's date):
https://tinyurl.com/HapticsAllison