Perceiving Two Dimensions

John C. Hart

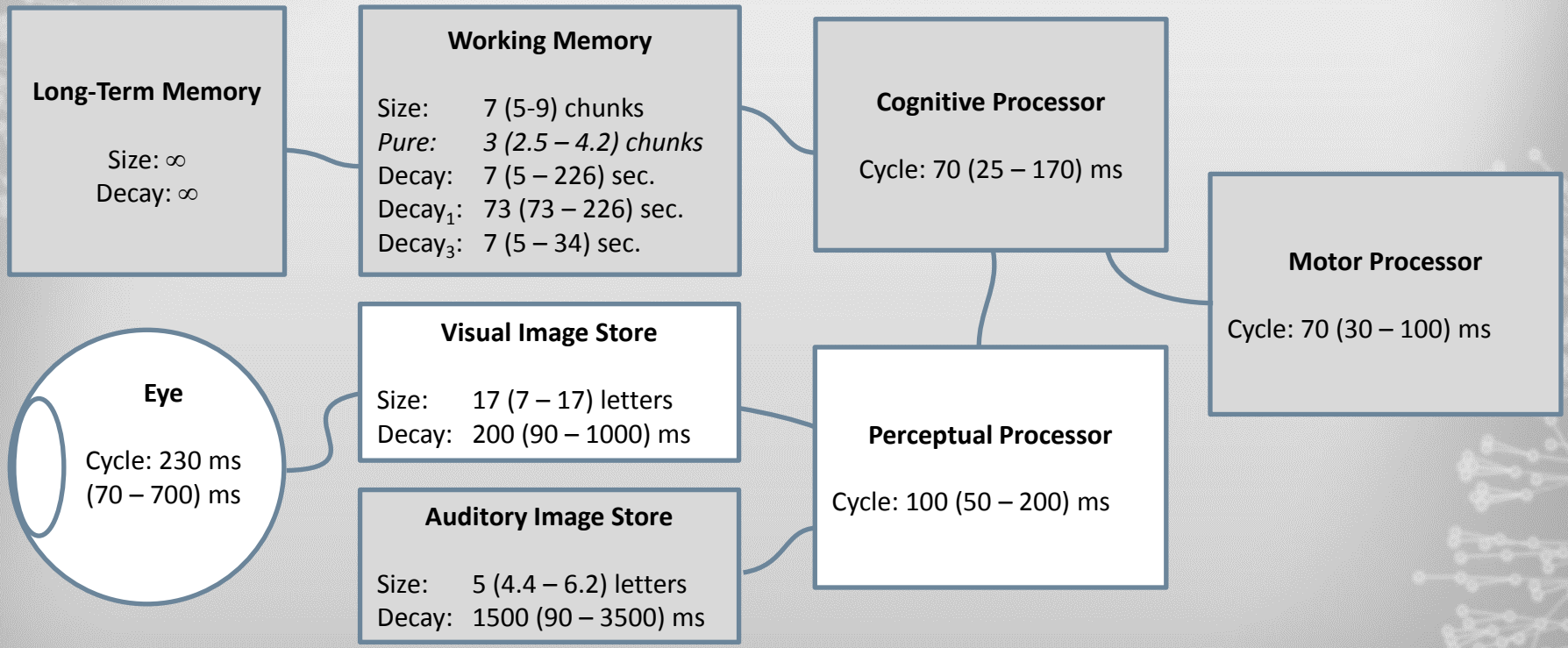
Department of Computer Science

University of Illinois at Urbana-Champaign

What We Will Learn

- How does the human visual system collect individual rod and cone signals into a shape?
- How can I make sure visual data will be properly perceived?

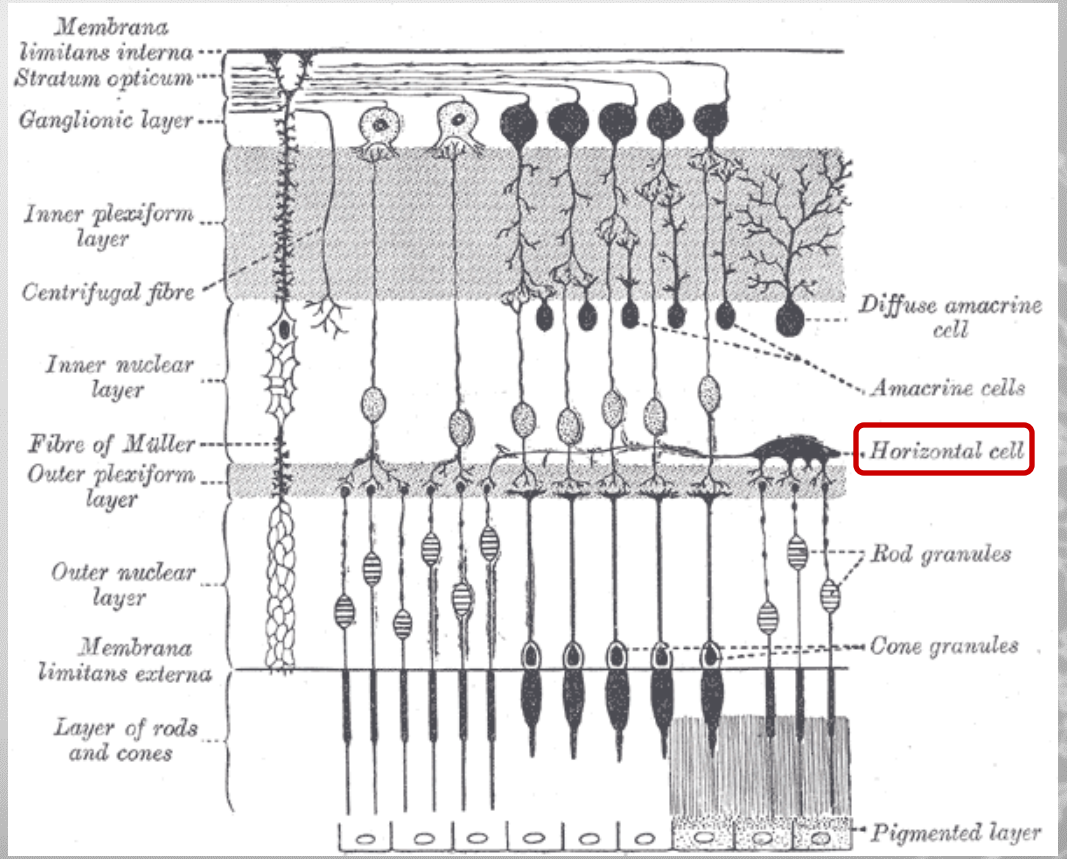
The Model Human Processor



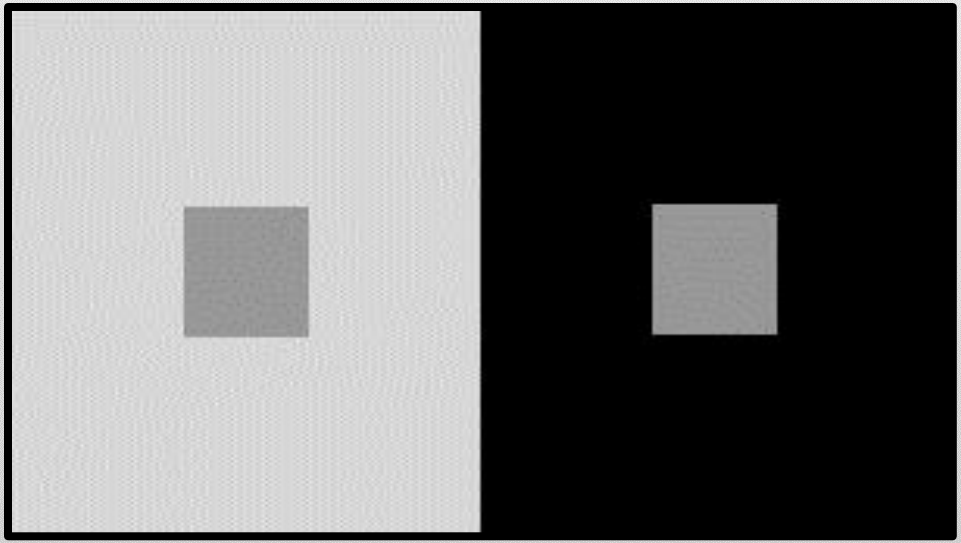
Card, Stuart K. "The model human processor: A model for making engineering calculations of human performance." In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 25(1),1981. pp. 301-305

Lateral Inhibition

- Horizontal cells accentuate and exaggerates differences in space and time
- Eye's internal real-time edge and motion detector
- Used to detect predators like tigers in the bushes

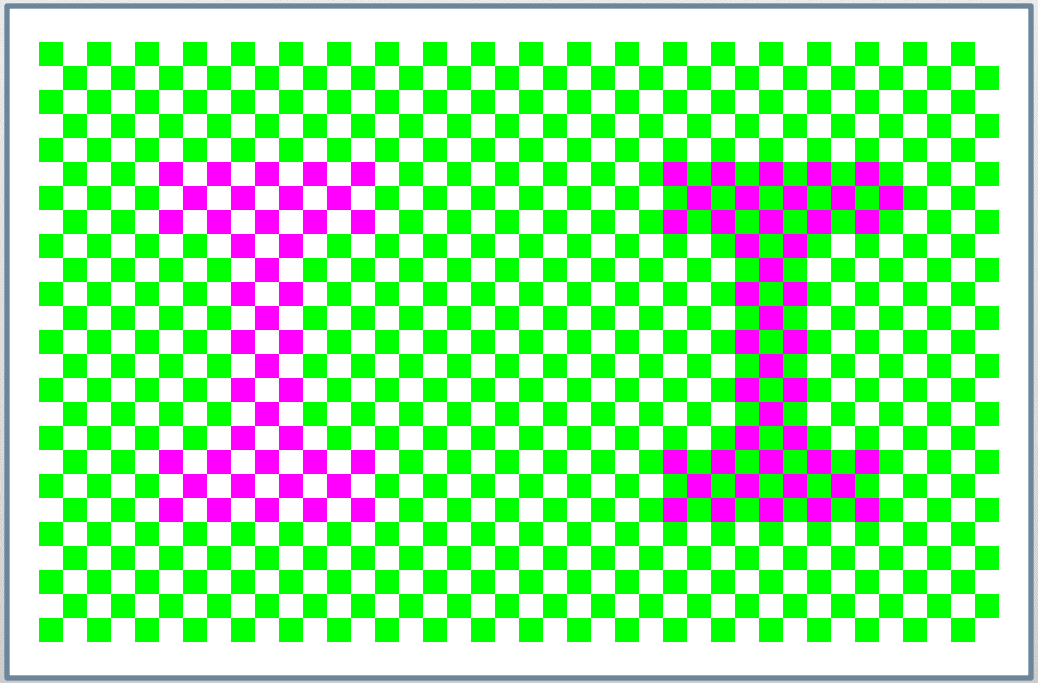


Shade Context

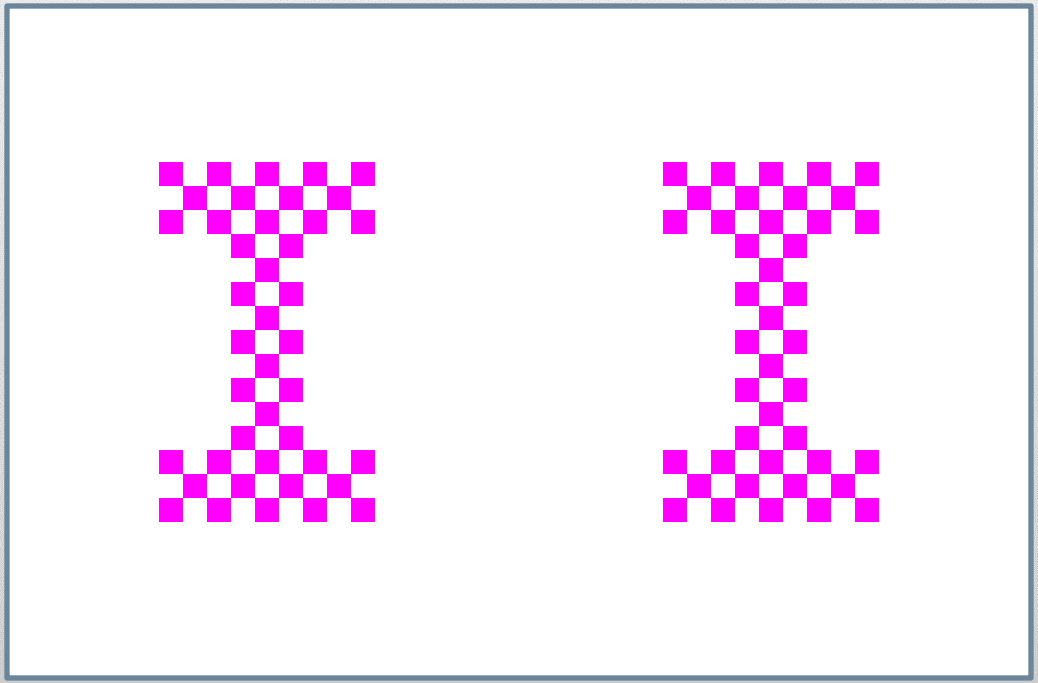


Shade Context

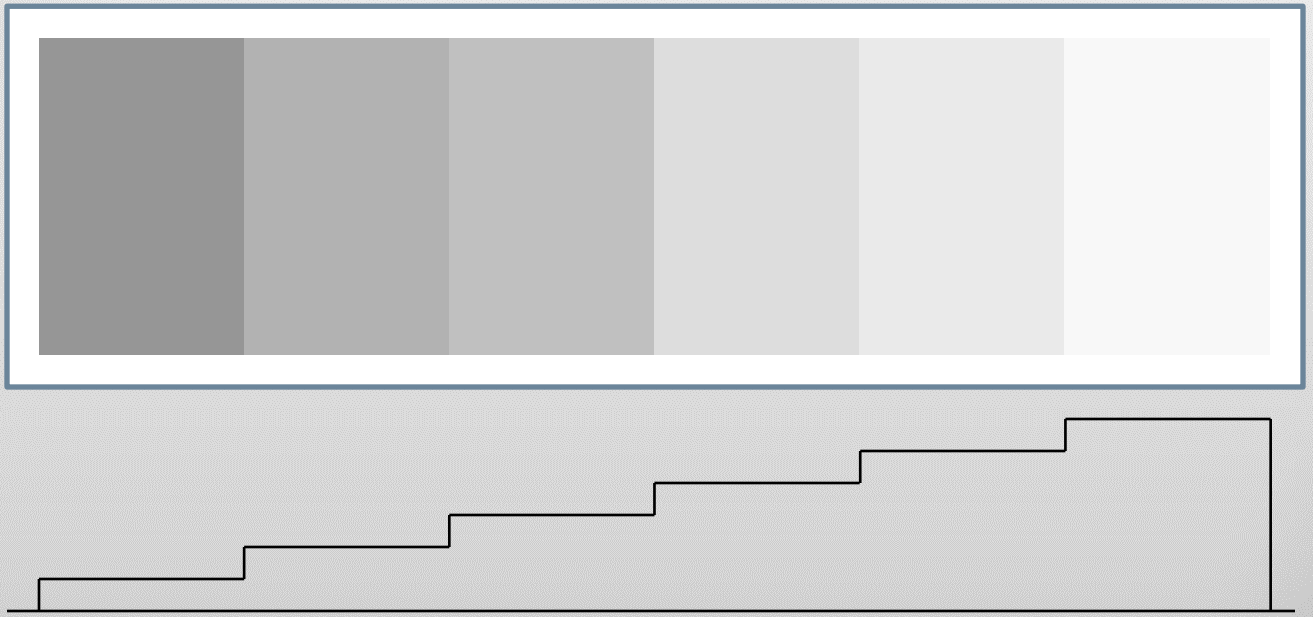
Color Context



Color Context



Mach Bands



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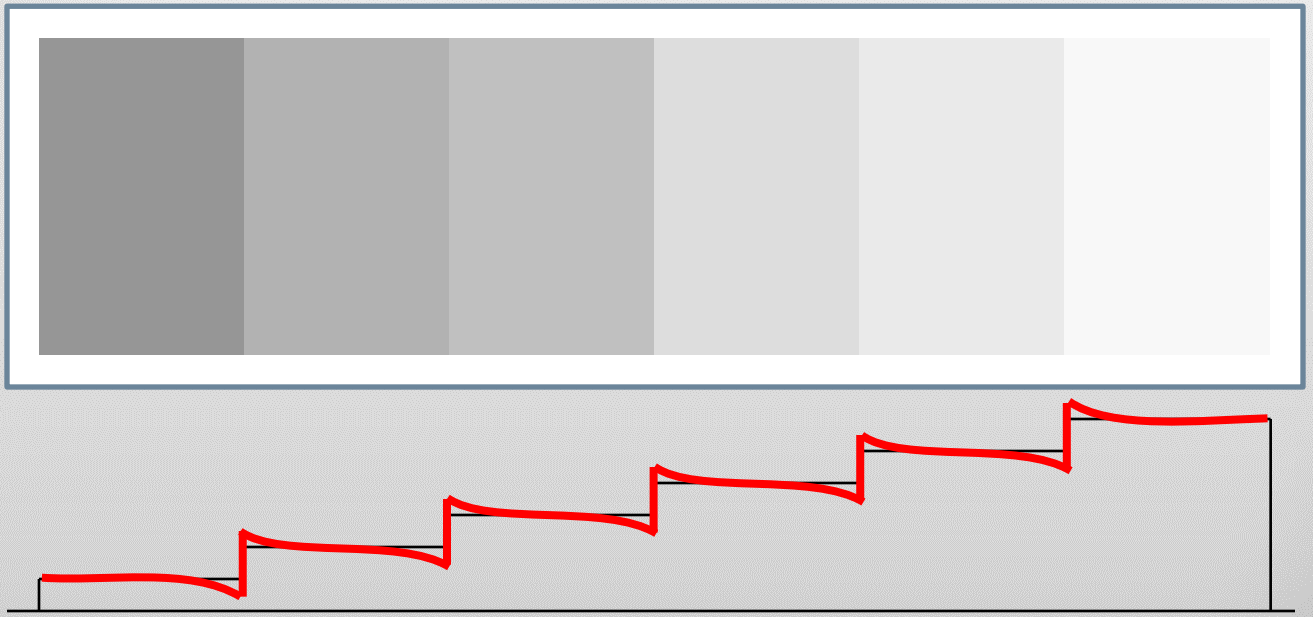

Perceptual system will try to accentuate the edges

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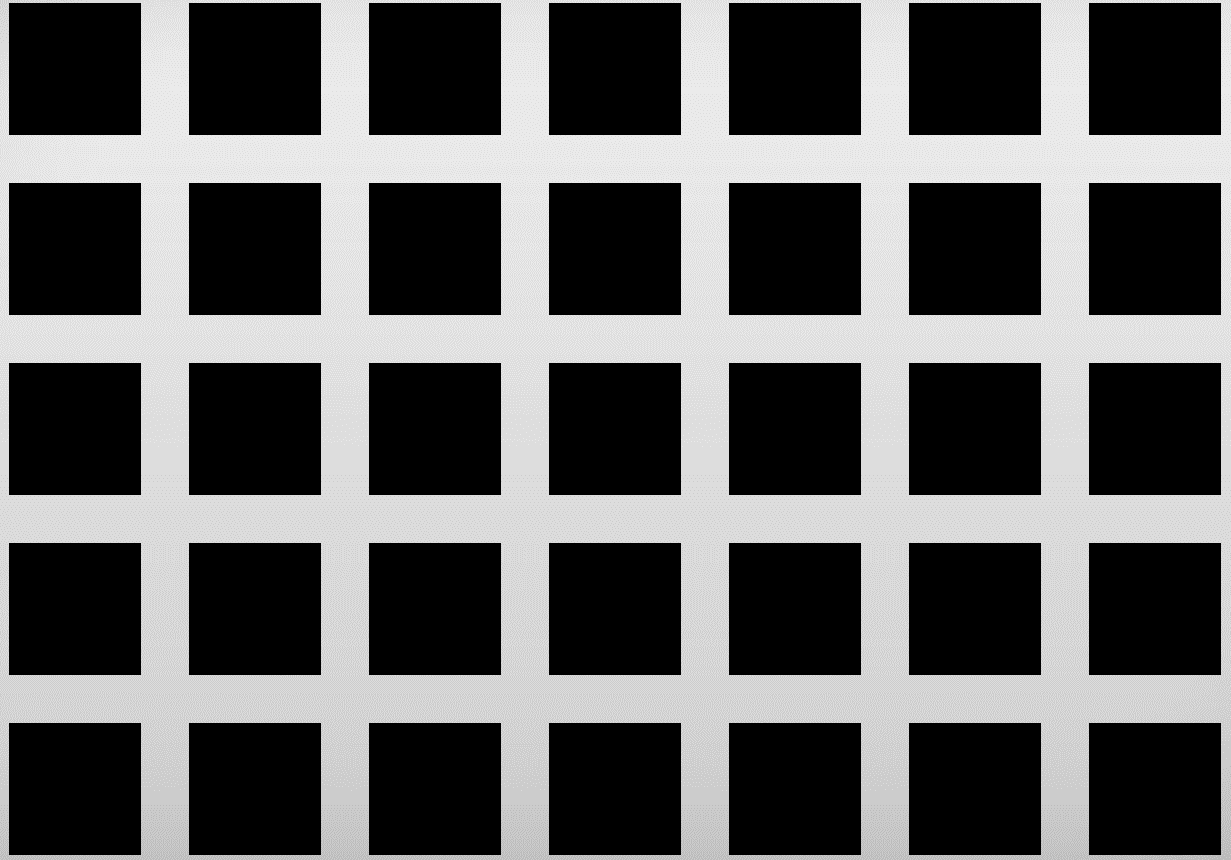
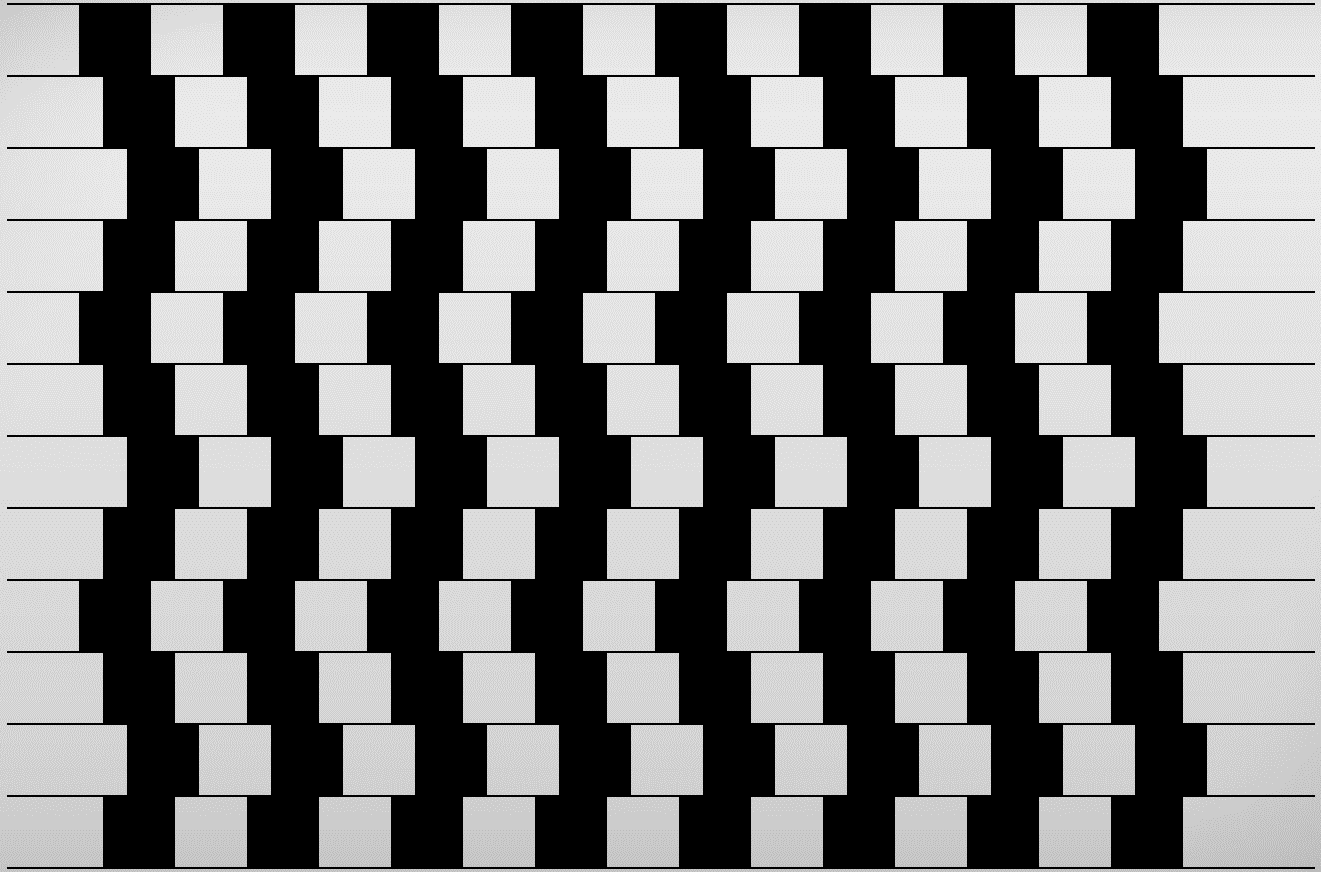
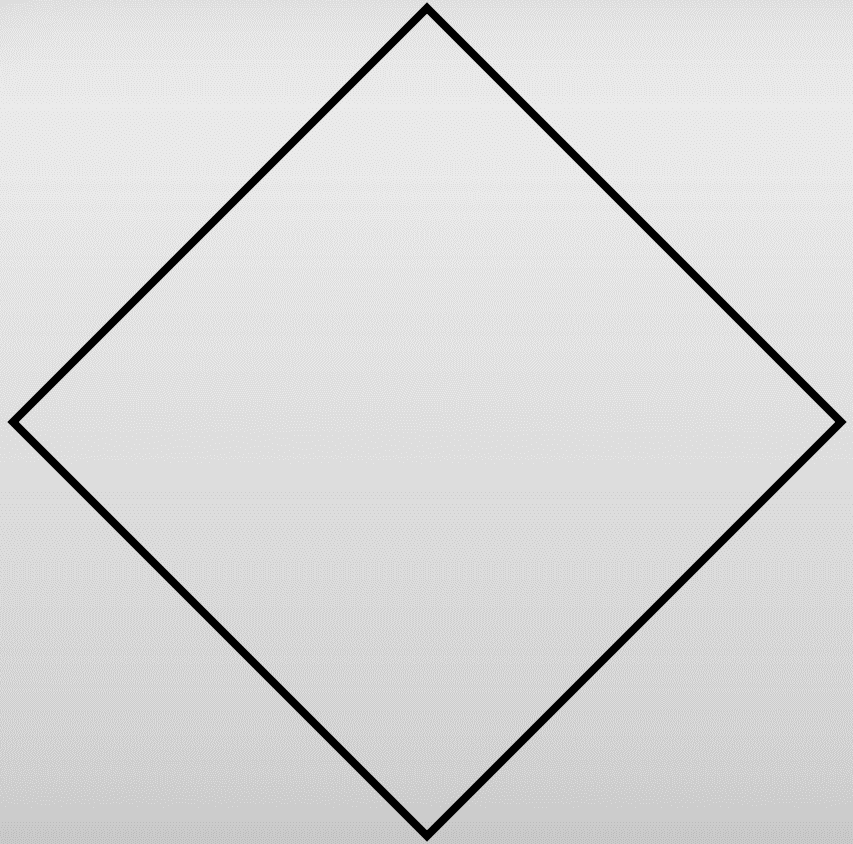
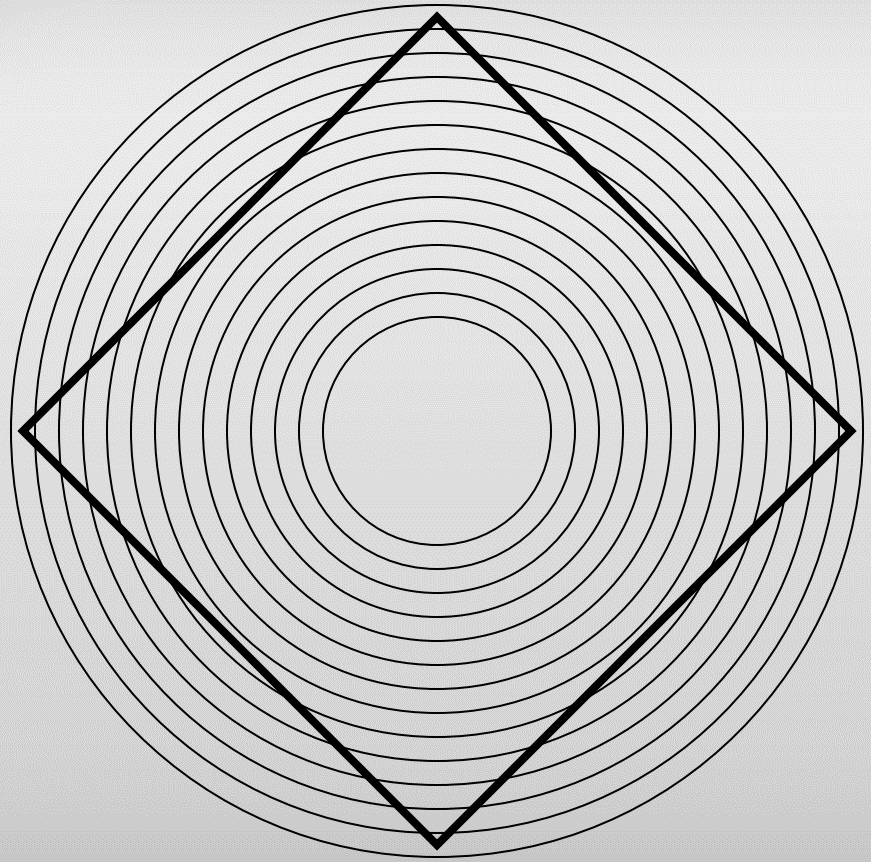
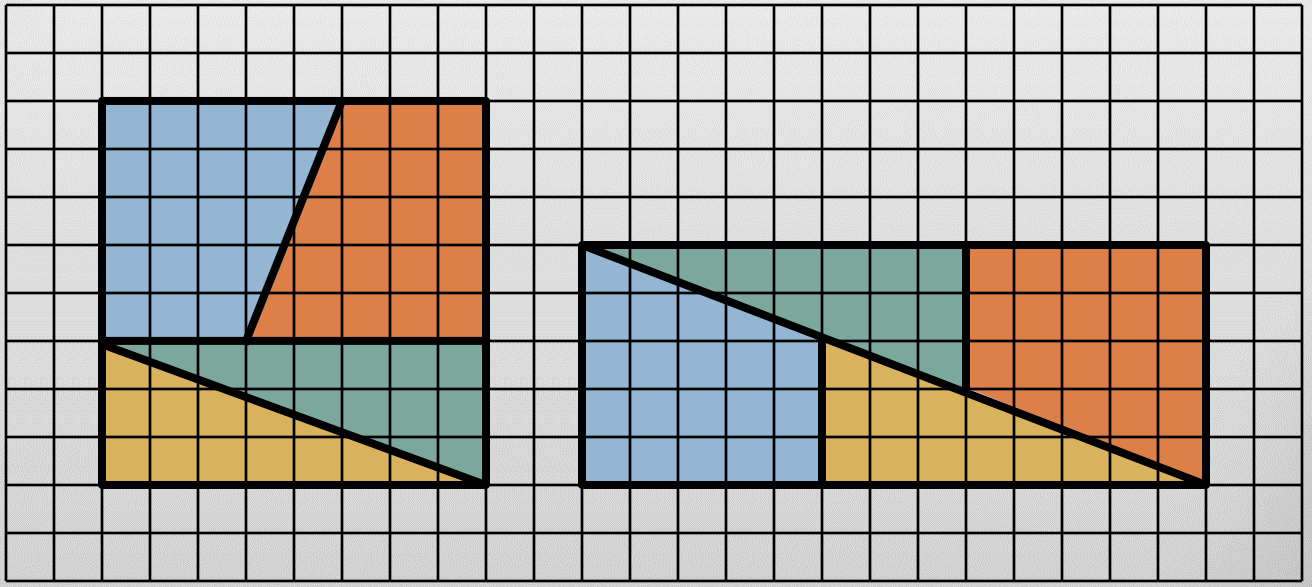








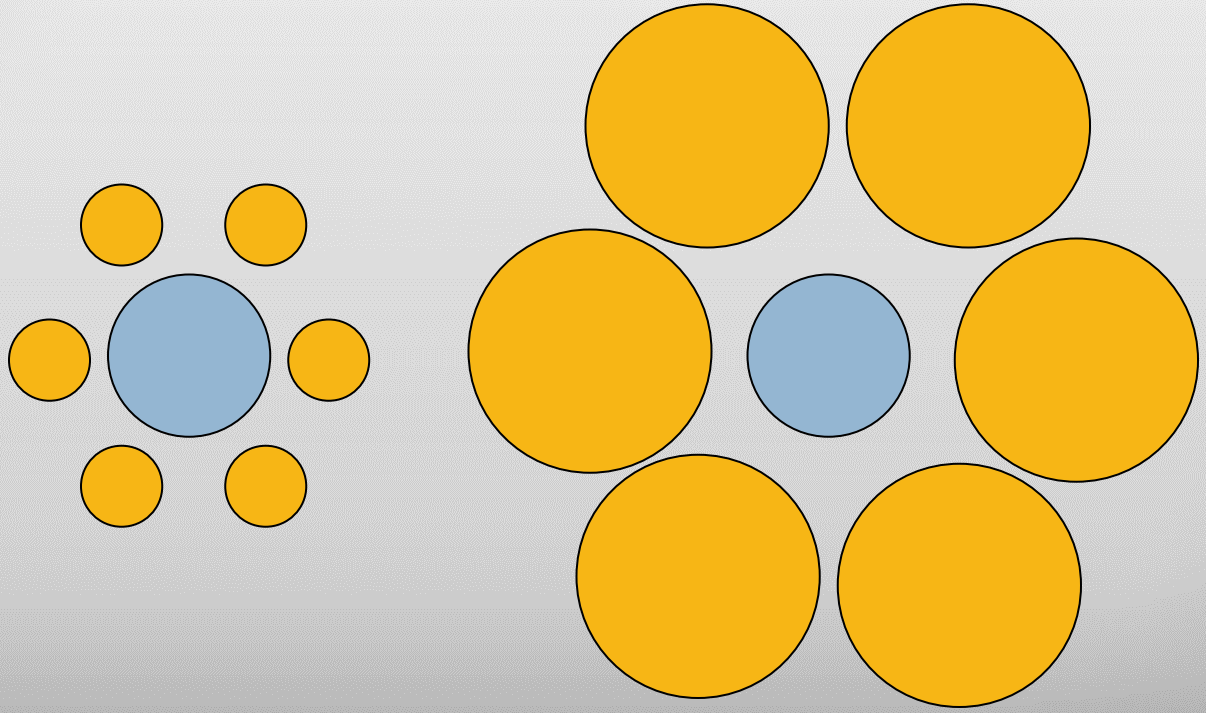
Perception v. Cognition



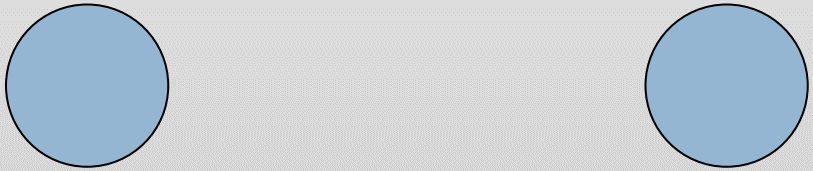
8 x 8 = 64

13 x 5 = 65

Size Context



Size Context



What Did We Learn?

- Various forms of lateral inhibition help our visual system see and accentuate shapes in context of neighboring shapes
- This lateral inhibition can also interfere with the proper perception of visual data
- Always use consistent contexts for visual comparisons

avoid illusion