Perceiving Perspective

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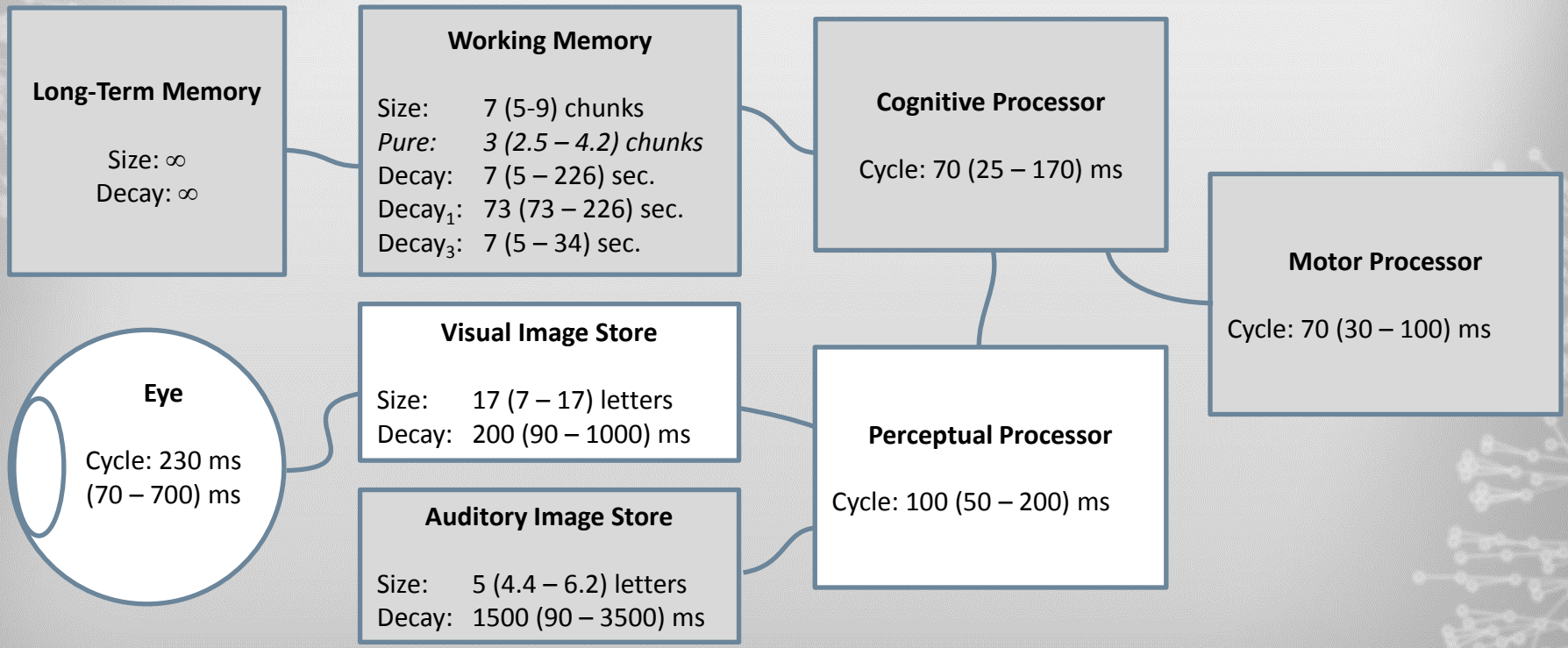
What Will We Learn?

- How do we perceive a 3-D world from the 2-D image on our retina?
- How can this perception interfere with the visual presentation of 2-D data?
- How can we avoid the perception of 2-D data as 3-D data?

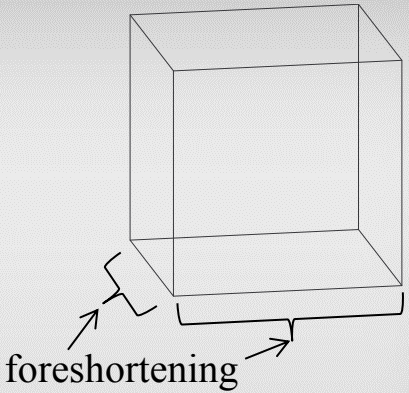
The Model Human Processor

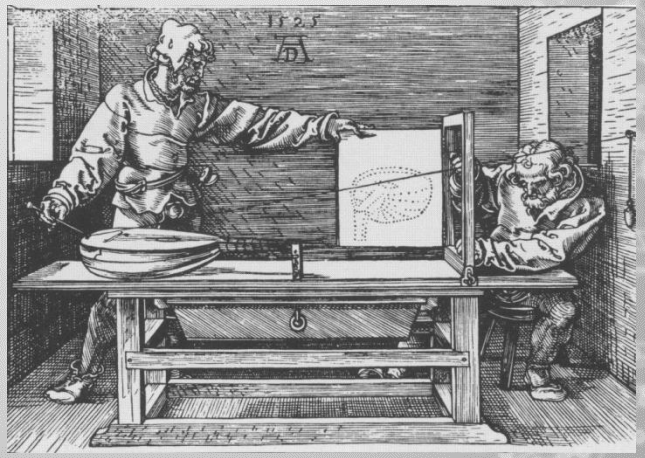


Card, Stuart K. "The model human processor: A model for making engineering calculations of human performance." In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 25(1),1981. pp. 301-305

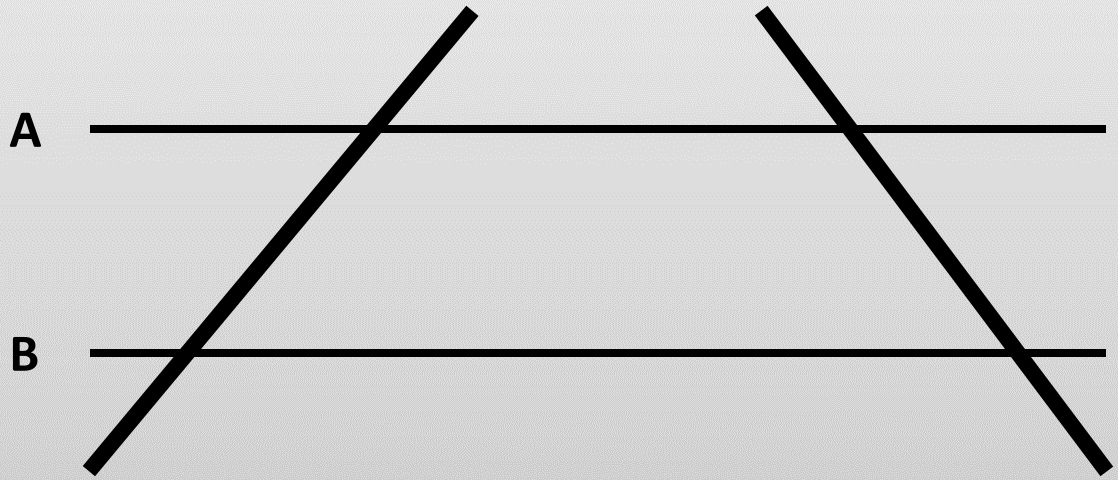
Perspective

- **Foreshortening**: Objects at different depth along a similar line of sight project to nearby locations on the image plane
- **Linear Perspective**: Objects farther away appear smaller
- **Size Constancy**: Objects do not change size, so smaller objects must be farther away than larger objects

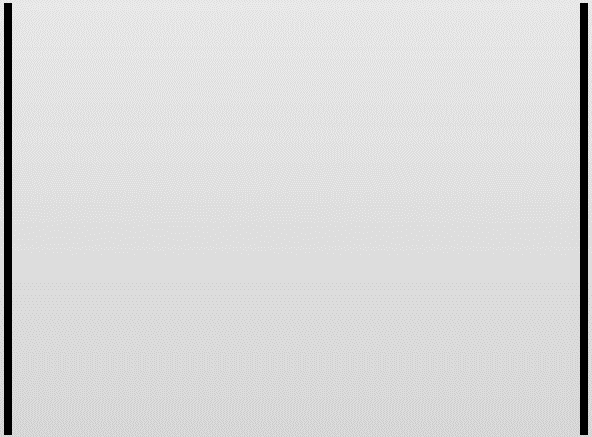


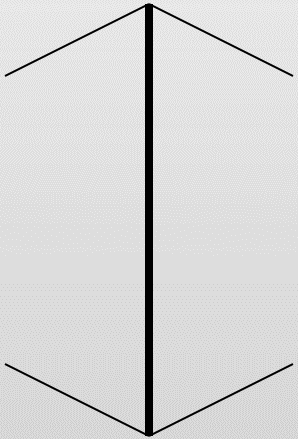


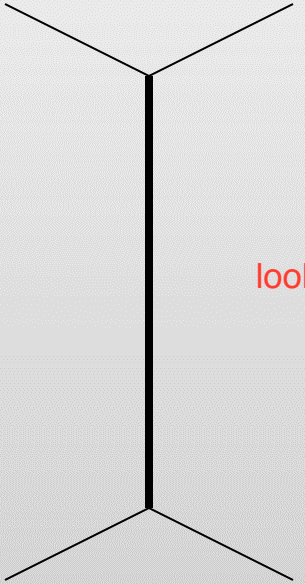
Size Constancy



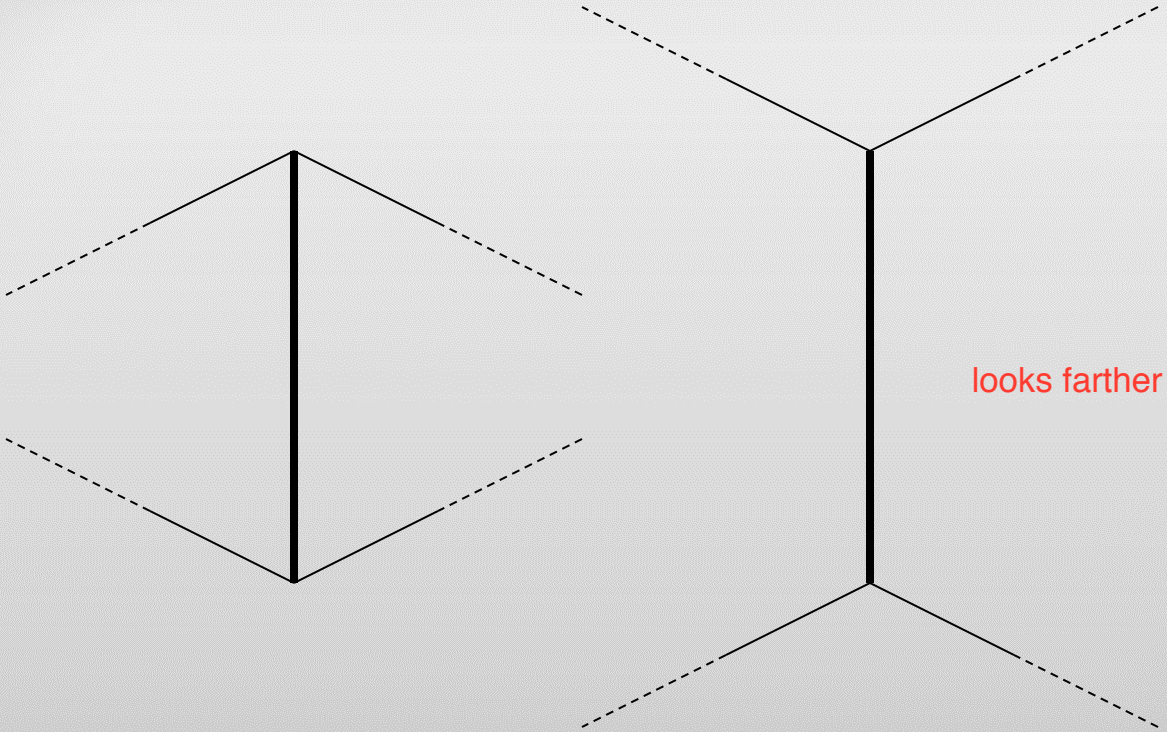
Size Constancy



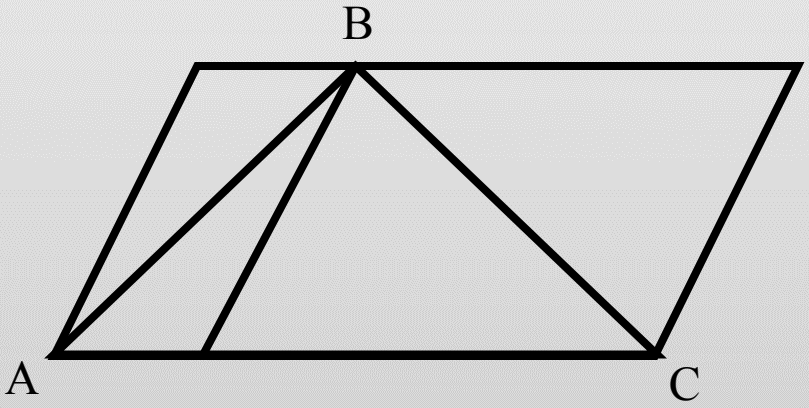




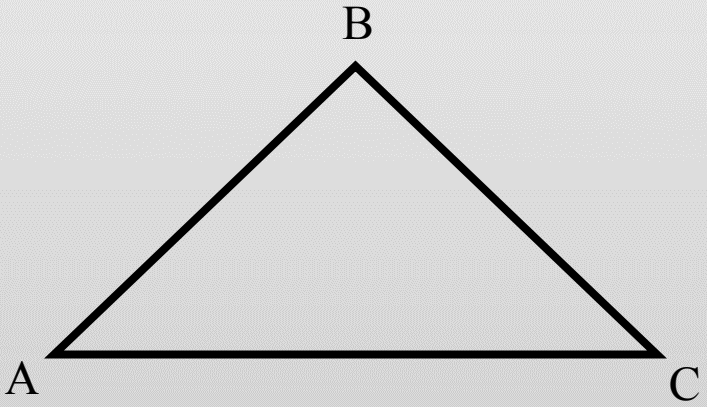
looks taller


looks farther

Which is Longer, AB or BC?

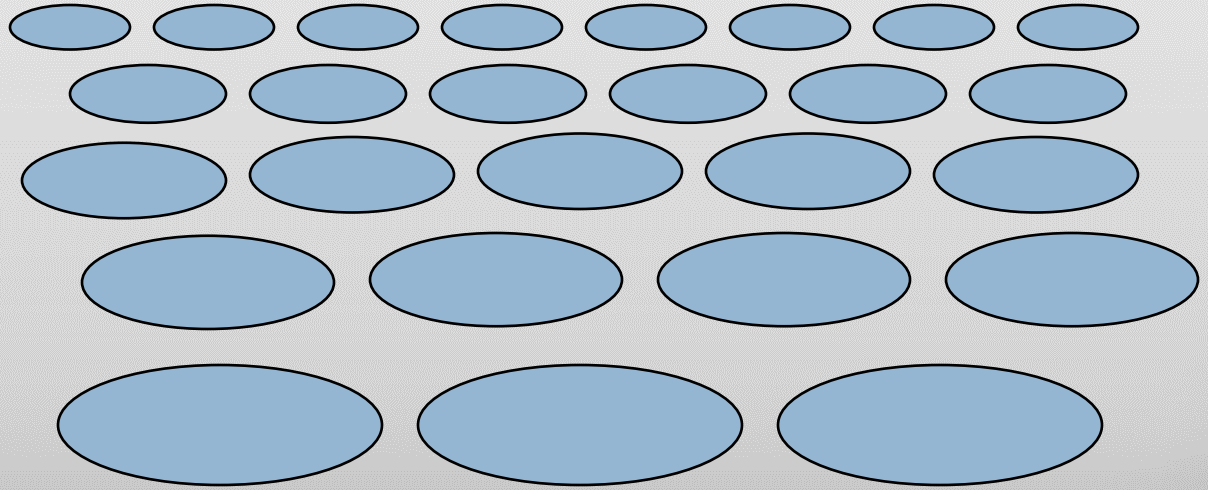


Which is Longer, AB or BC?

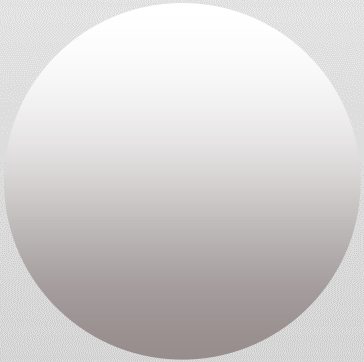


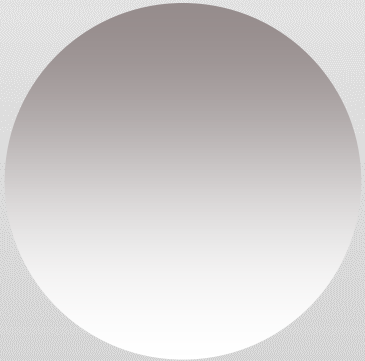
Texture Constancy

- Expect objects to be same size in 3-D
- Differences must be due to perspective



Lighting Assumptions





What Did We Learn

- Our perception of size of an object is influenced by our perception of the distance to the object
- Avoid the incorporation of artificial 3-D elements in the presentation of 2-D data