

THE ILLUSION OF REALITY

THE ILLUSION

- “Virtual reality works
because reality is virtual”
– Lawrence Stark, UC Berkeley

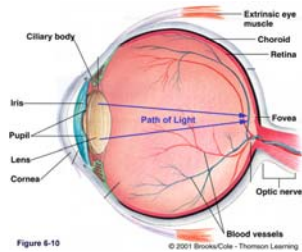


THE ILLUSION

- We experience a high-resolution spatial
and temporal continuum when we look
around the 3D environment we are in.
- This is an **illusion!**

THE ILLUSION

- The retinal image of the visual field is in focus only in a very small area: The **fovea**.



THE ILLUSION

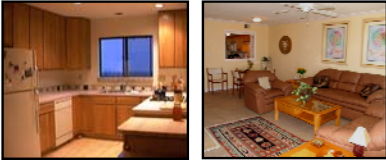
- We need to sample the visual field, with **saccades** and **fixations** (~3 per sec.) to construct an image.



scanpaths and what we see

THE ILLUSION

- Sampled information is relatively sparse when you walk into a room. You see the typical things and think you have seen the whole room.



THE ILLUSION

- You can change the way that you see by changing perceptual filters.
- For example: "I want to see squares"...



"I want to see squares"



"I want to see circles"

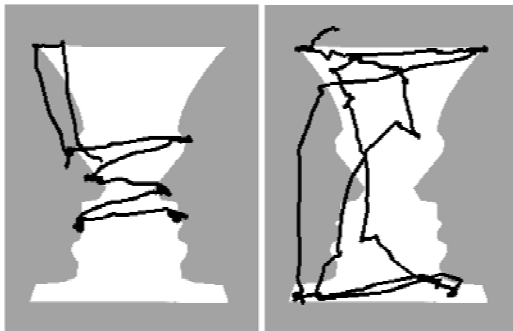
THE ILLUSION

- **Fixating** ~90 % of the time.
- **Checking and rechecking** points of interest, as if gathering support for what we think we are seeing.
- It is hard to overcome strong **presuppositions**, such as what a room looks like...



... or what a **vase** looks like





(a) Scanpath for two faces

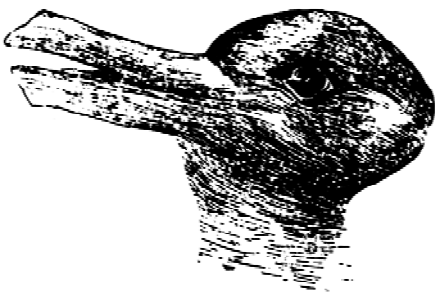
(b) Scanpath for vase





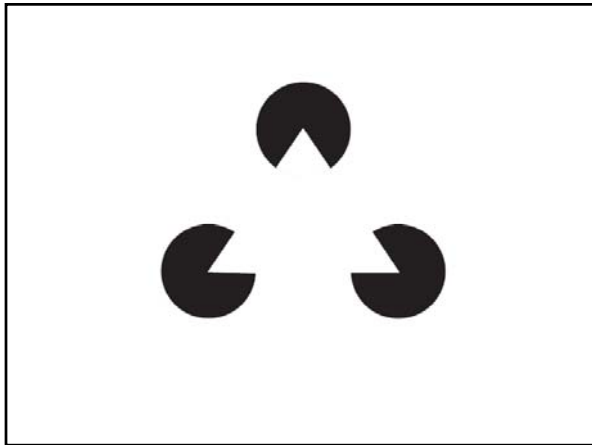
THE ILLUSION

- We see what is in **our mind's eye**, and use sampled visual information to verify this.
- The **scanpath** is driven by our **mental model**. Change the model and the scanpath changes.



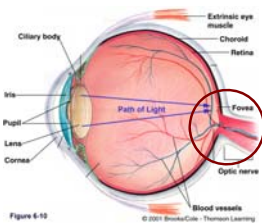
THE ILLUSION

- Our model can even make us see things that we **don't have any sensory data** for!



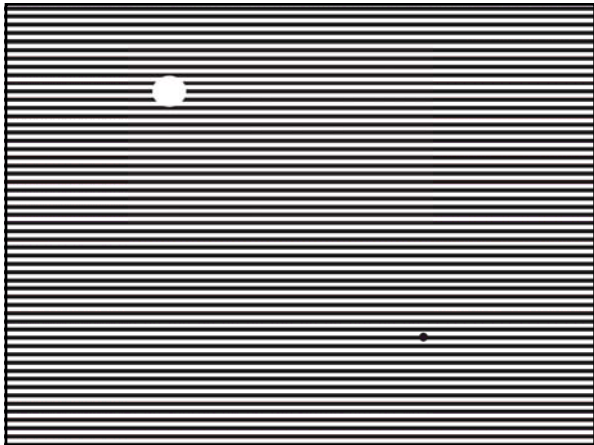
THE ILLUSION

- That's a good thing, because we are actually **missing some data...**



THE ILLUSION

- Can you find your blind spot?



THE ILLUSION

- Information is integrated across neighboring areas.

- It's **image processing!**



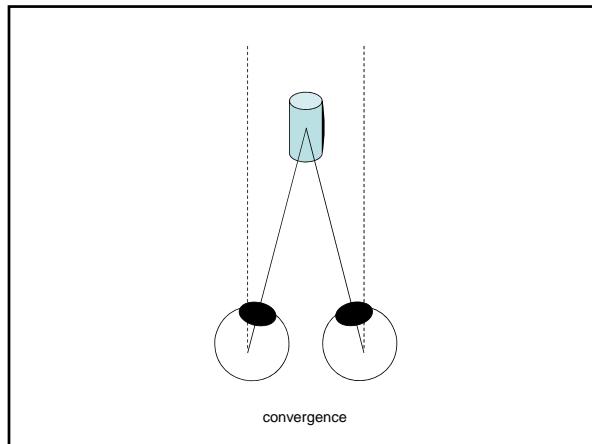
THE ILLUSION OF 3D WORLDS

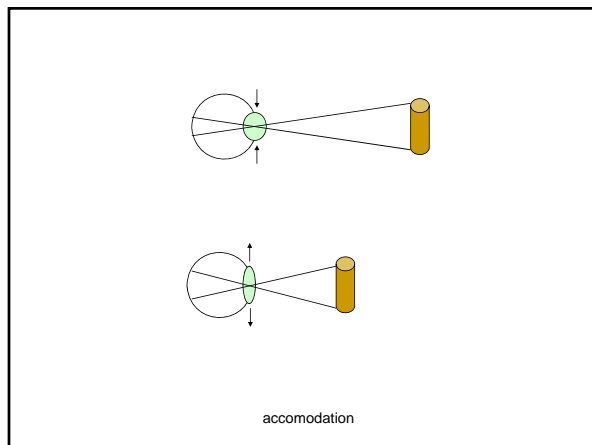
3 D WORLDS

- How do we perceive immersion in a 3D environment?

3 D WORLDS

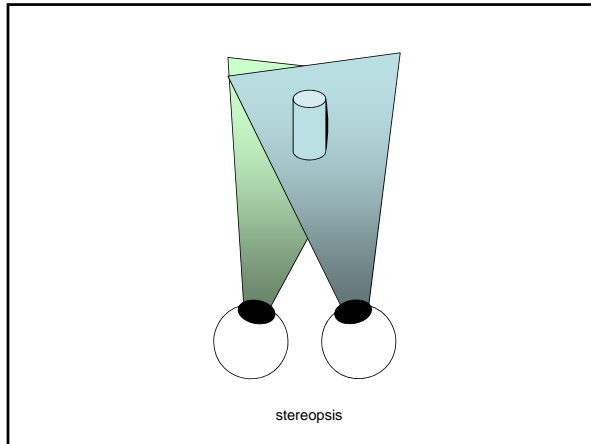
- How do we perceive immersion in a 3D environment?
 - Physiological cues
 - Stereoscopic cues
 - Static cues
 - Motion cues





3D WORLDS

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 - **Stereoscopic cues**
 - Static cues
 - Motion cues



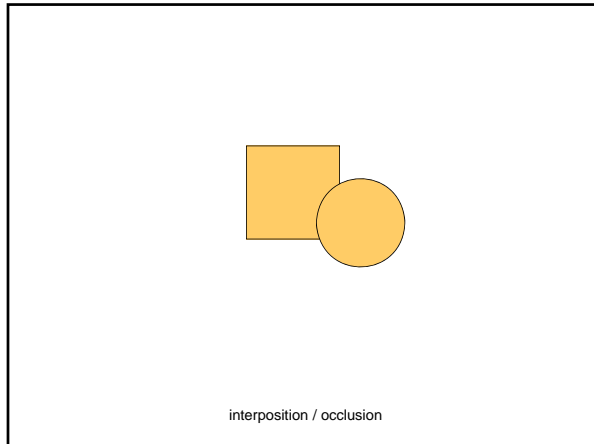
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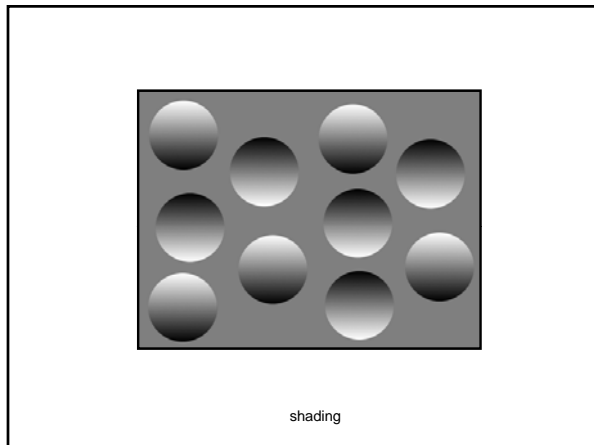
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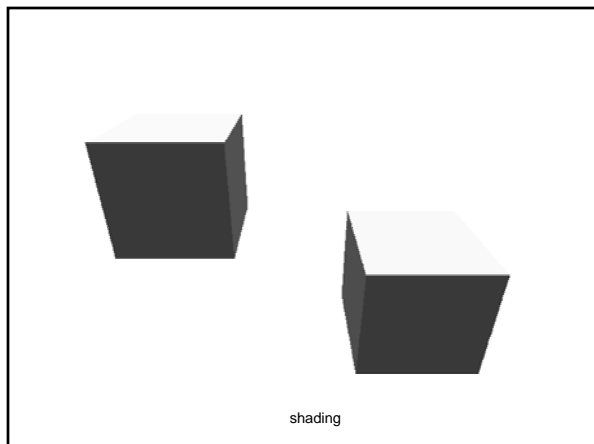
But even if we close one eye we see the world in 3D – how can that be? (also on TV etc.)

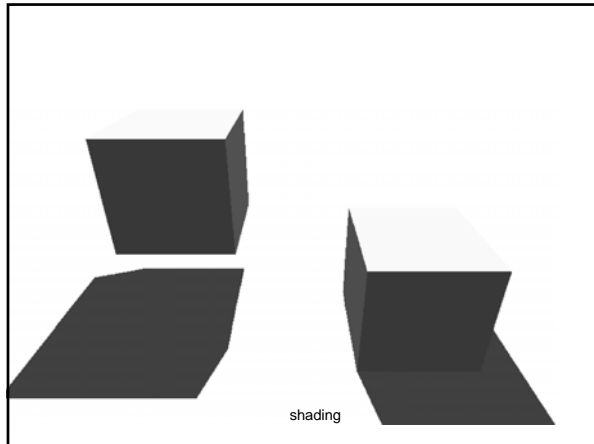
3 D WORLDS

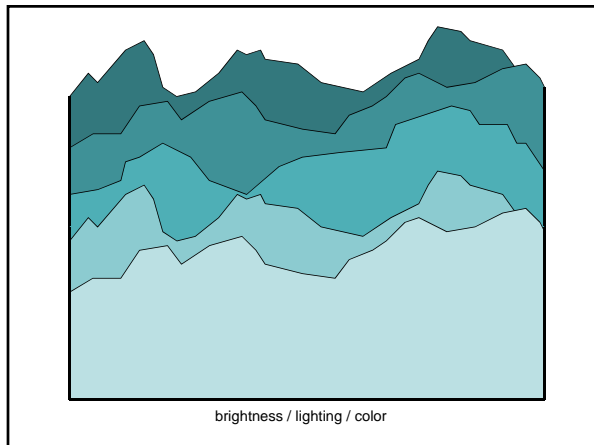
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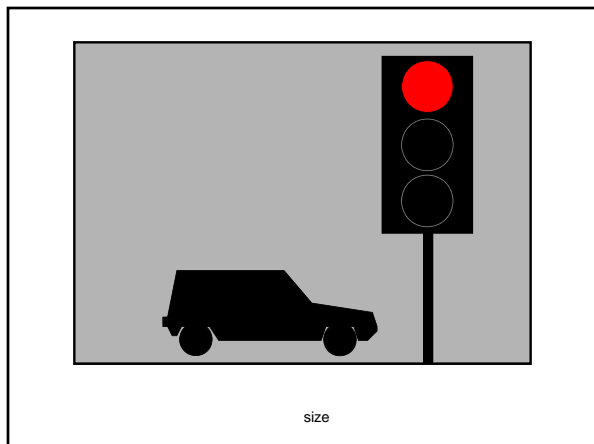


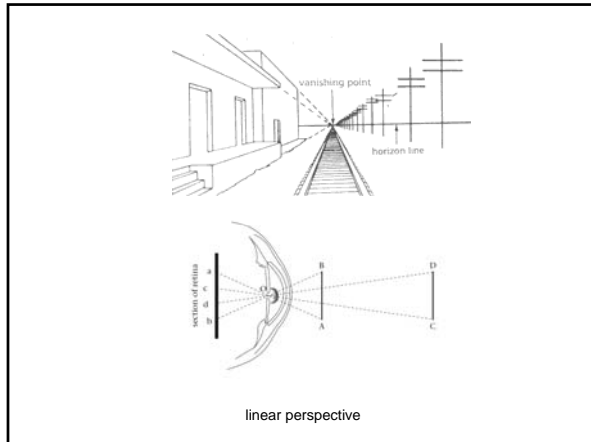


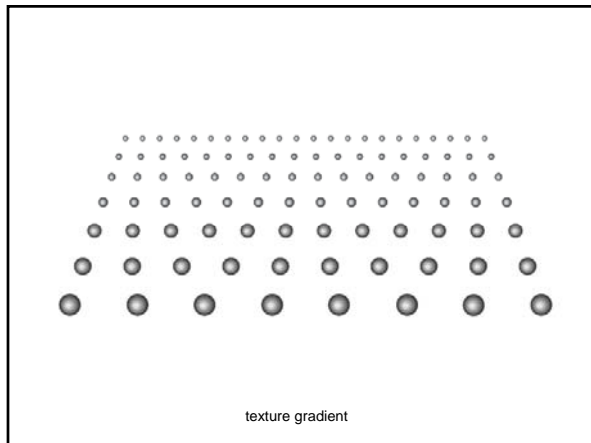






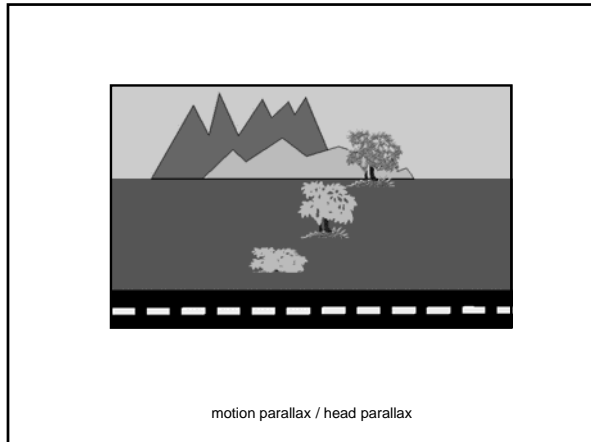






3 D W O R L D S

- How do we perceive immersion in a 3D environment?
 - Physiological cues
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3 D WORLDS

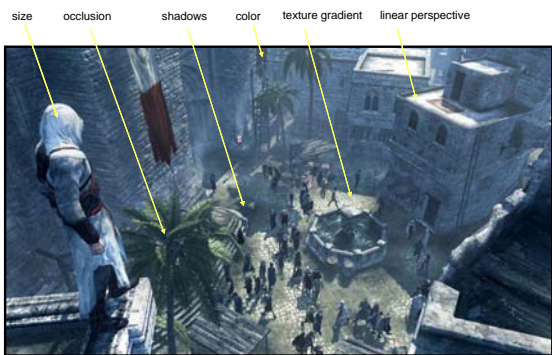
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3 D WORLDS

- To sum up - Paint the 3D world into the **mind of the receiver**:
 - Build a mental model with expected behavior.
 - Address the expectations.
 - Avoid contradictions.
 - Build layers of strong consistent cues.



spot the cues?



spot the cues?

