OSHER LIFELONG LEARNING INSTITUTE

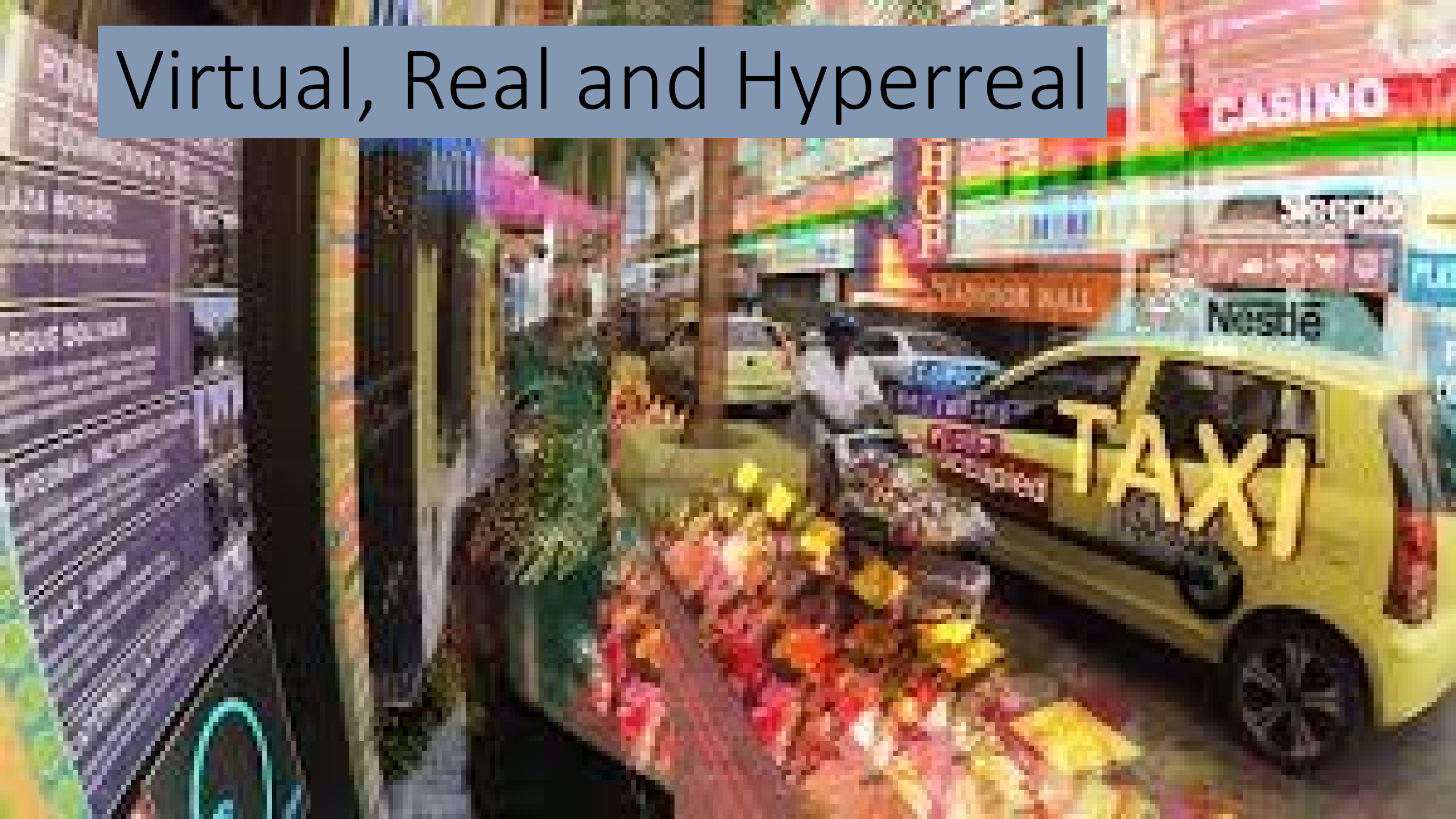
Virtual Reality: Hype, Reality, and Hyperreality

John P. Sullins

Ph.D. 2002, Ph.D in Philosophy, Computers and Cognitive Science, Binghamton University

Sonoma State University Philosophy Department. 2003-

Virtual, Real and Hyperreal



TECHNOETIC

- Use of technology in cultural production
  - Technology +
  - Noetic: how we understand the world
- Refers to how technologies are changing our perceptions and therefore our understanding of our world
- A term that is used in digital arts

THE FUTURE OF VIRTUAL REALITY | PHIL KAUFFOLD | TEDXSONOMACOUNTY

PSYCHOLOGICAL SKEPTICISM

- You feel that you are in good reality contact
- But psychology tells us that that is wrong
- What you are experiencing as reality is your own *personal version* of reality, and that it may or may not be the same as the reality being experienced right now by others around you
- You might disagree, or might think the idea is crazy
    - We will use our critical thinking skills now to explore this unsettling idea

HOW DO YOU KNOW WHERE YOU ARE AND WHAT IS HAPPENING RIGHT NOW?

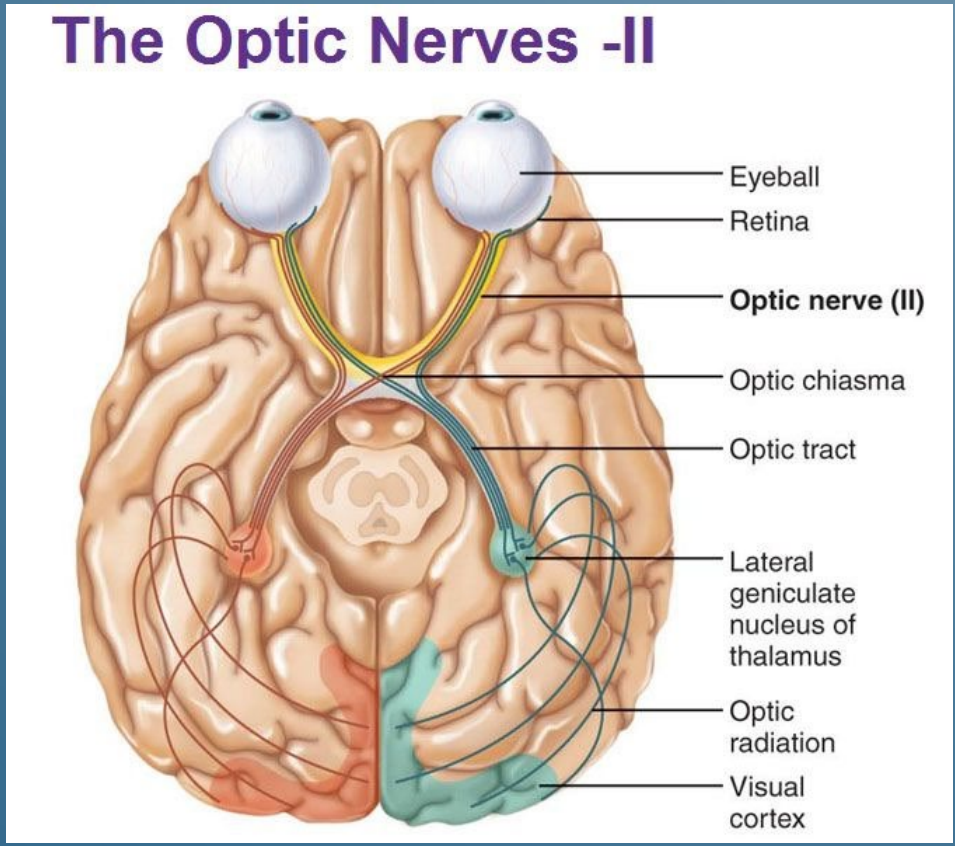
WHY DID YOU SIT IN THE CHAIR THAT YOU CHOSE TODAY? WHY NOT THE ONE NEXT TO YOU WITH THE OTHER PERSON IN IT?

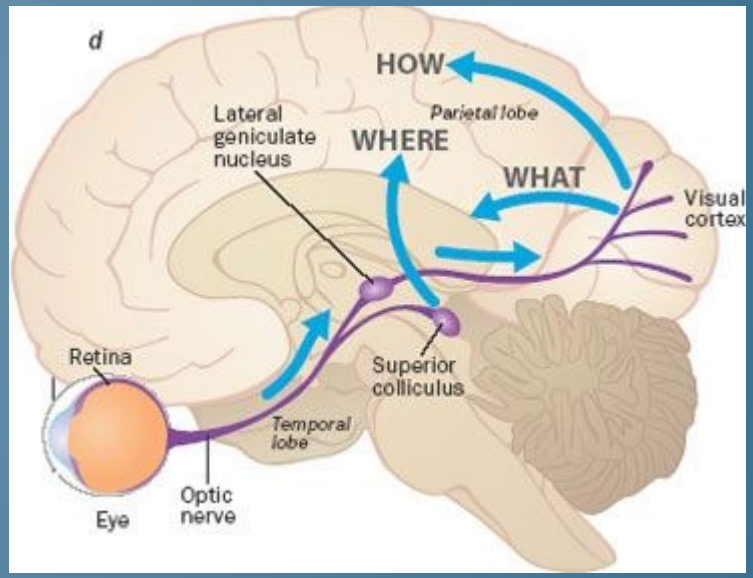
When light bounced off that other person and entered your eyes, it was converted into a pattern of nerve impulses that went to your brain.

the retina, the optic nerve, the thalamus, the visual cortex.

- Your brain compared that pattern with patterns that you have seen before and that are stored in your memory.
- Your brain discovered that the pattern matched the mental category (or concept) that in your language is called “a person.”
- Your brain also retrieved from memory the knowledge that two physical objects cannot occupy the same space at the same time.
- It also retrieved its stored knowledge of the rules for proper social behavior in your culture and decided against trying to throw the other person out of the chair. Instead, it directed your eyes to search for an object whose pattern of light energy matched the mental category “empty seat” and then directed your muscles to sit you in it.

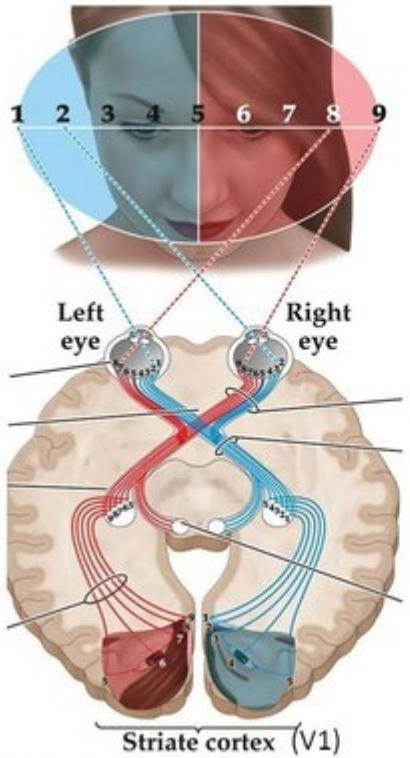
VISUAL PERCEPTION

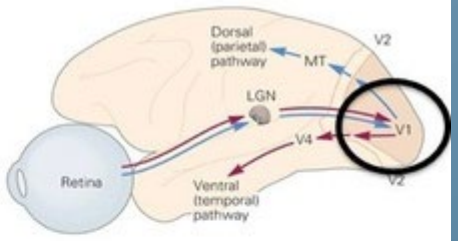




VISUAL PERCEPTION

V1 retinotopic maps



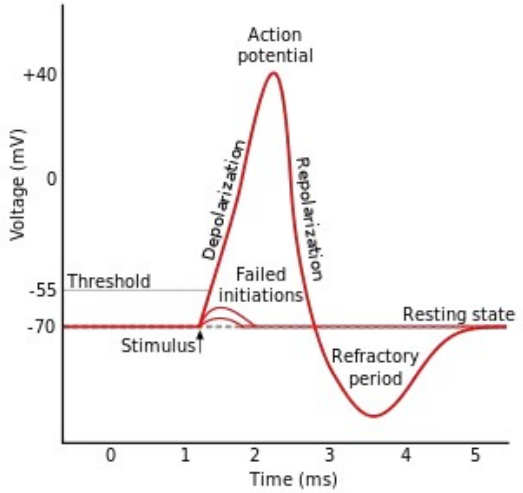


- Each point of the visual field maps on to a local group of neurons in V1.
- Retinotopy = Remapping of retinal image onto cortical surface
- Foveal region uses more of V1 (greater magnification factor)

SENSATION & PERCEPTION 3e, Figure 3.14
© 2012 Sinauer Associates, Inc.

II. Neural activity — spiking rates and spike timing

The previous section deals with representation — the "meaning" or "reference" aspect of what neurons do. But we can also talk about neural coding at a more mechanistic level. How exactly does neural activity convey anything in the first place?

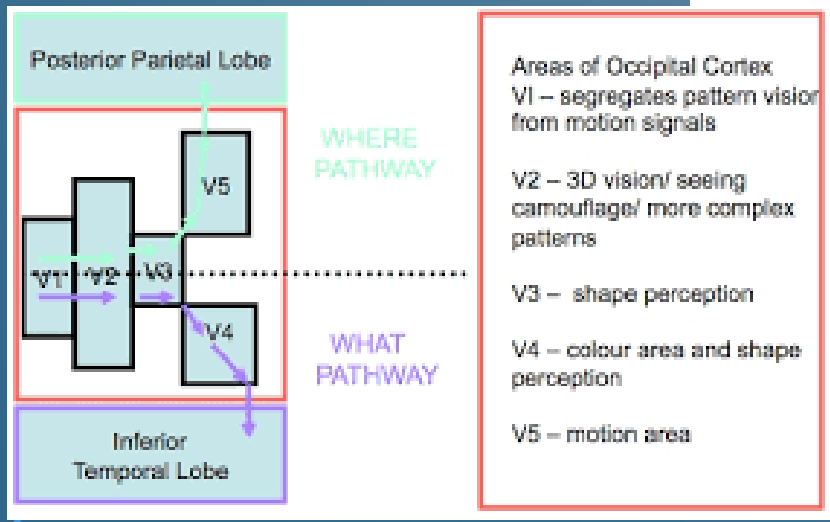


[Image source: Wikipedia]

A neuron is a complex biophysical 'device' capable of a dizzying array of dynamic behaviors. The standard response profile of a neuron involves a series of sharp fluctuations of its membrane potential (i.e., voltage). Each fluctuation is called an action potential or a "spike". A series of spikes on after the other is called a "spike train". Very fast clumps of spikes are called "bursts".

Action potentials are what travel along the axon of a neuron, leading to neuro-transmitter release at the synapse.

VISUAL PERCEPTION



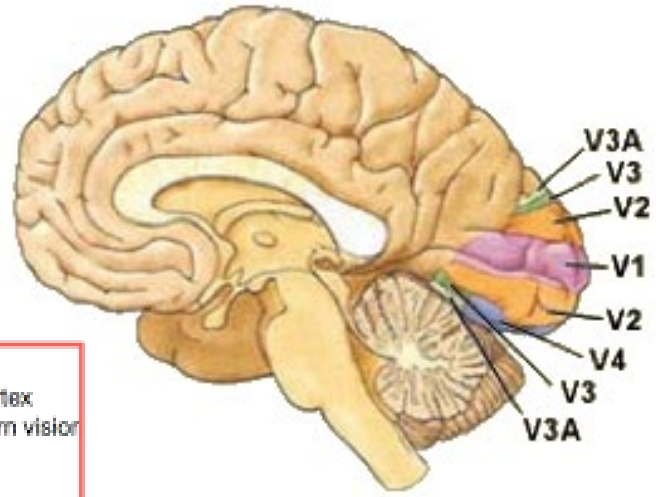
Areas of Occipital Cortex
VI – segregates pattern vision from motion signals

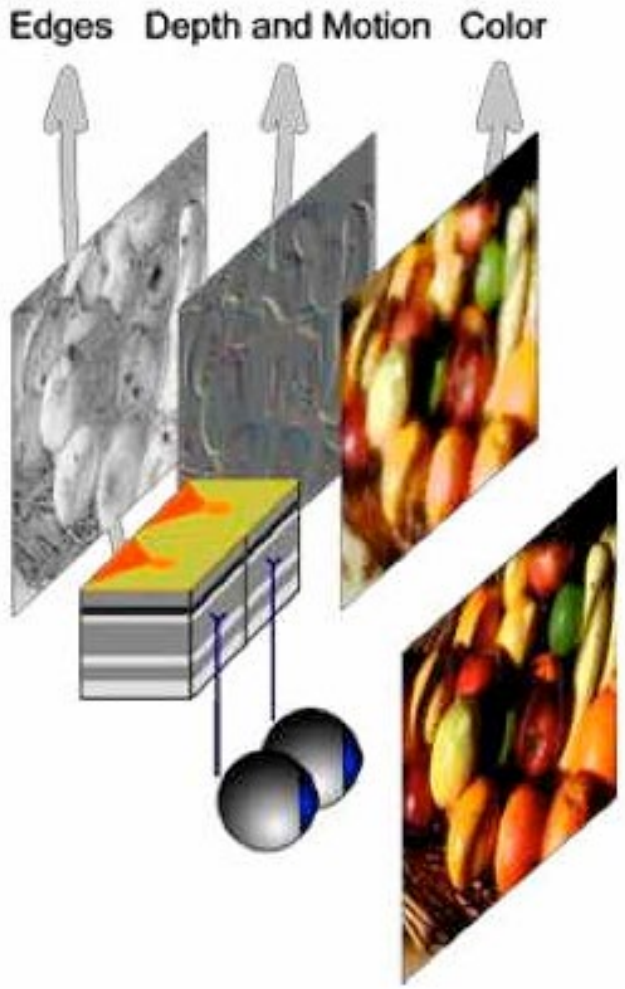
V2 – 3D vision/ seeing camouflage/ more complex patterns

V3 – shape perception

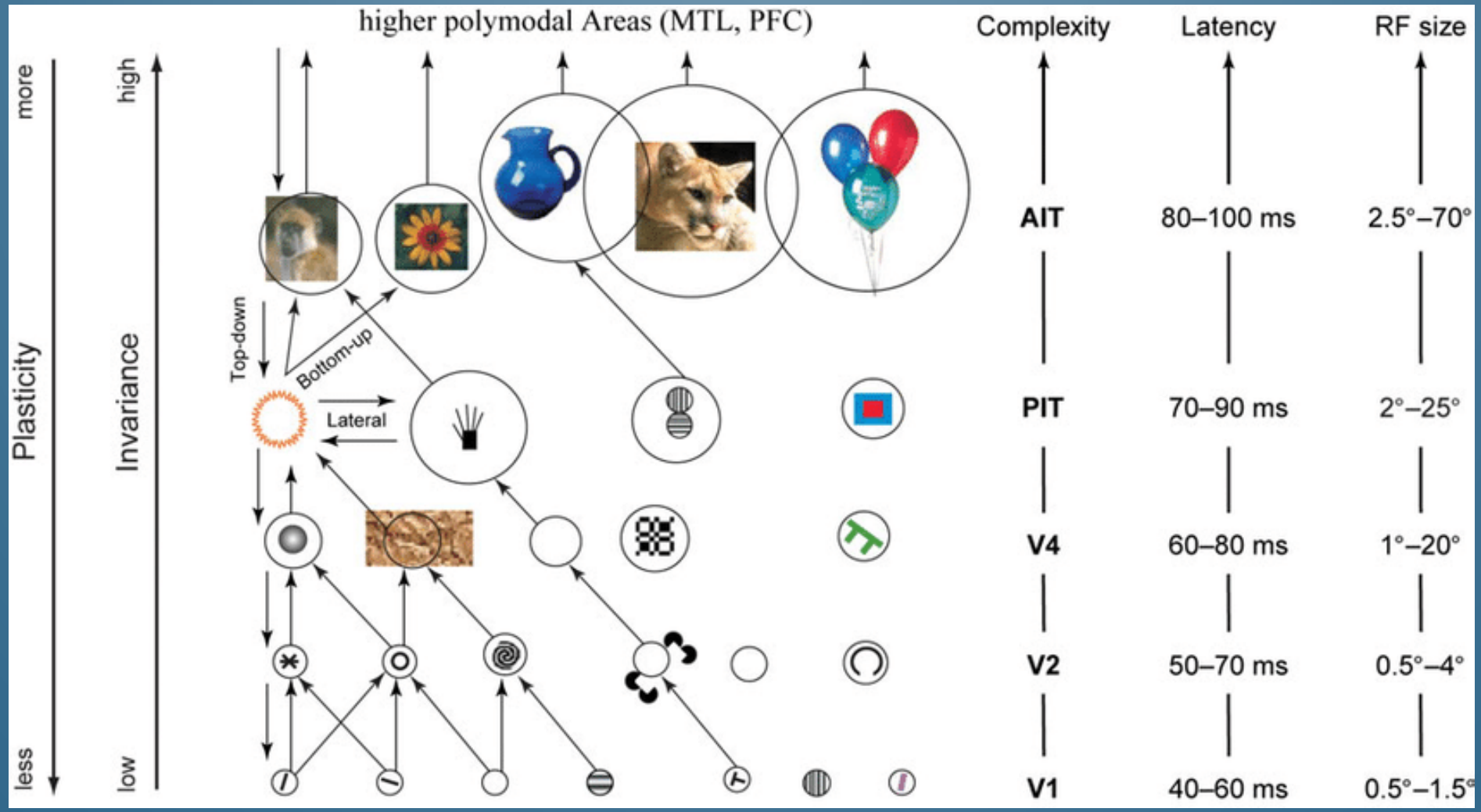
V4 – colour area and shape perception

V5 – motion area



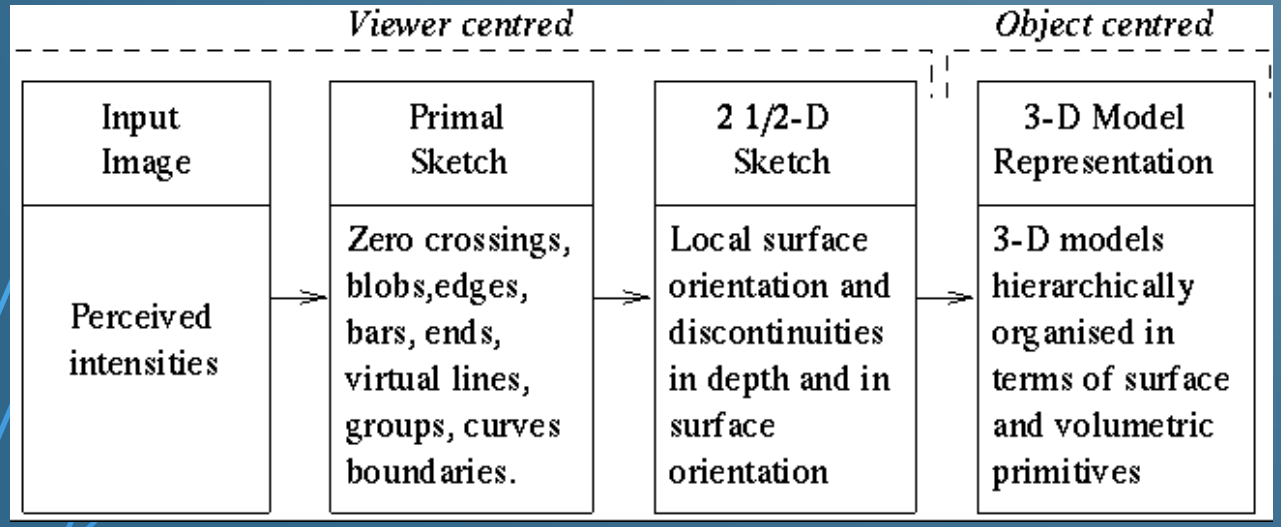


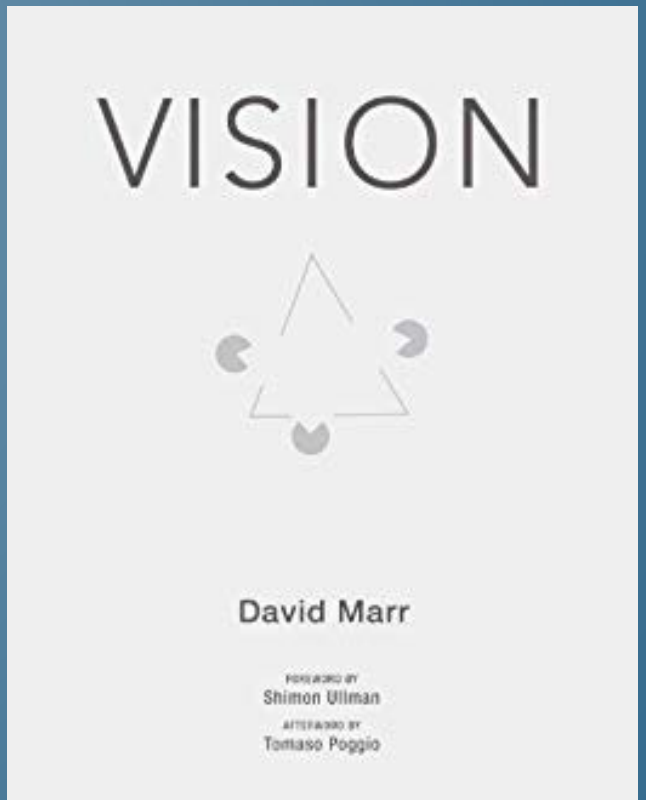
VISUAL PERCEPTION-TAKES TIME

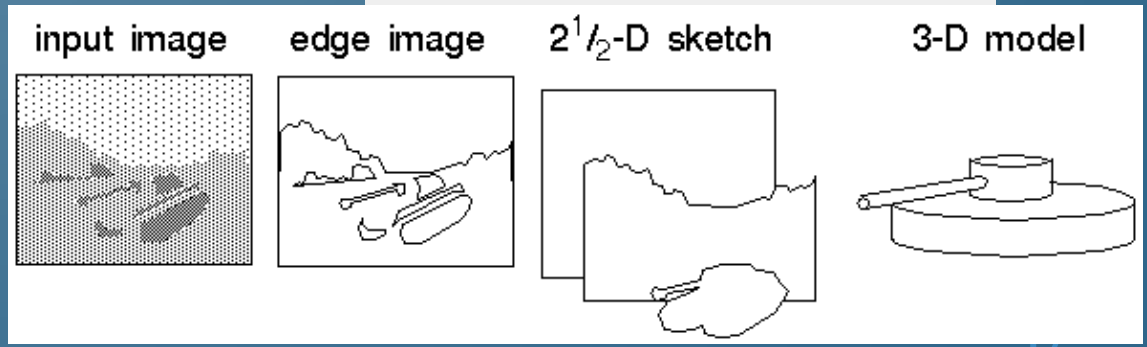


VISUAL PERCEPTION-TAKES TIME

- **David Courtenay Marr** (19 January 1945 – 17 November 1980) was a British neuroscientist and physiologist. Marr integrated results from psychology, artificial intelligence, and neurophysiology into new models of visual processing. His work was very influential in computational neuroscience and led to a resurgence of interest in the discipline.



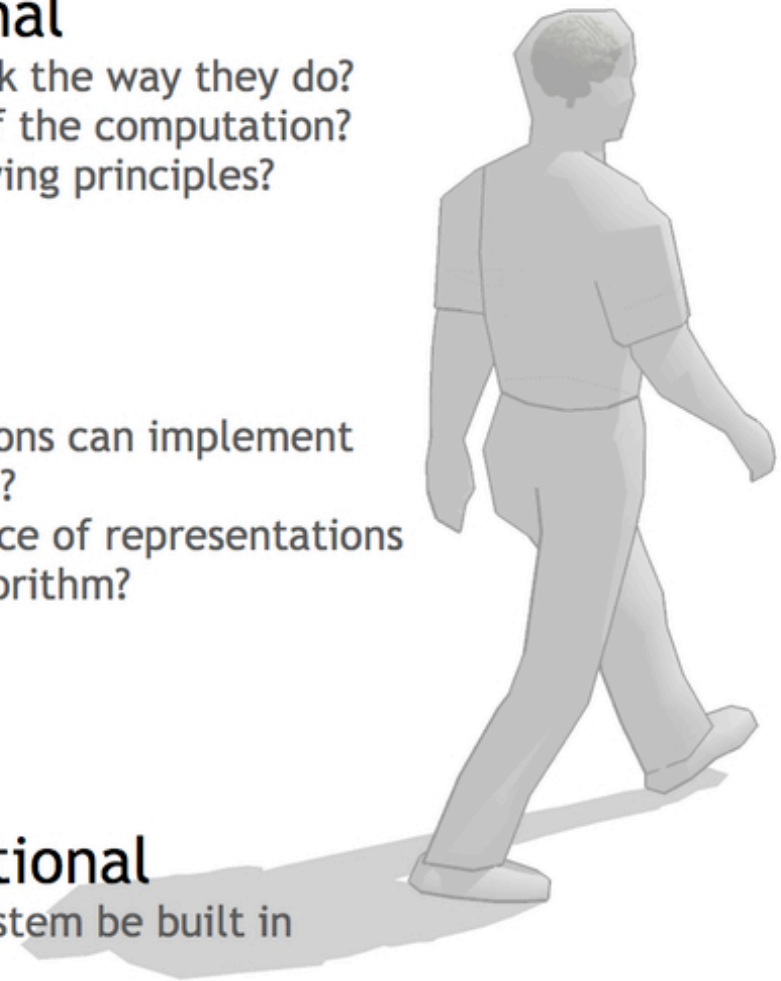




Three levels of description *(David Marr, 1982)*

Computational

Why do things work the way they do?
What is the goal of the computation?
What are the unifying principles?

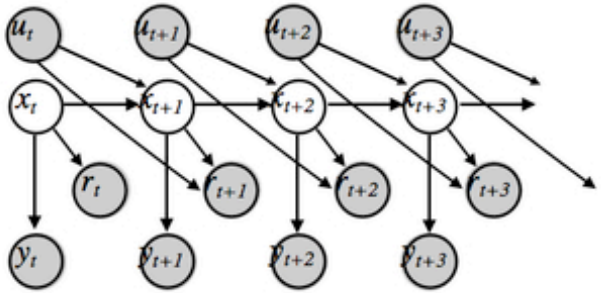


maximize:

$$R_t = r_{t+1} + r_{t+2} + \cdots + r_T$$

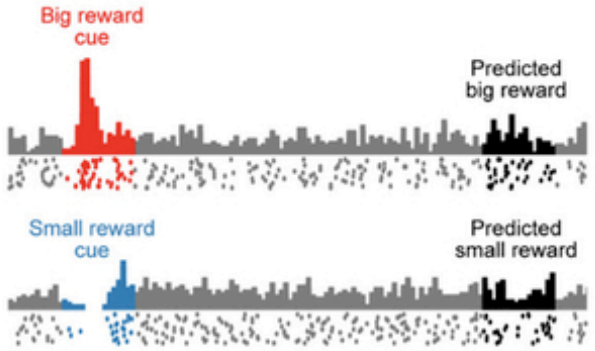
Algorithmic

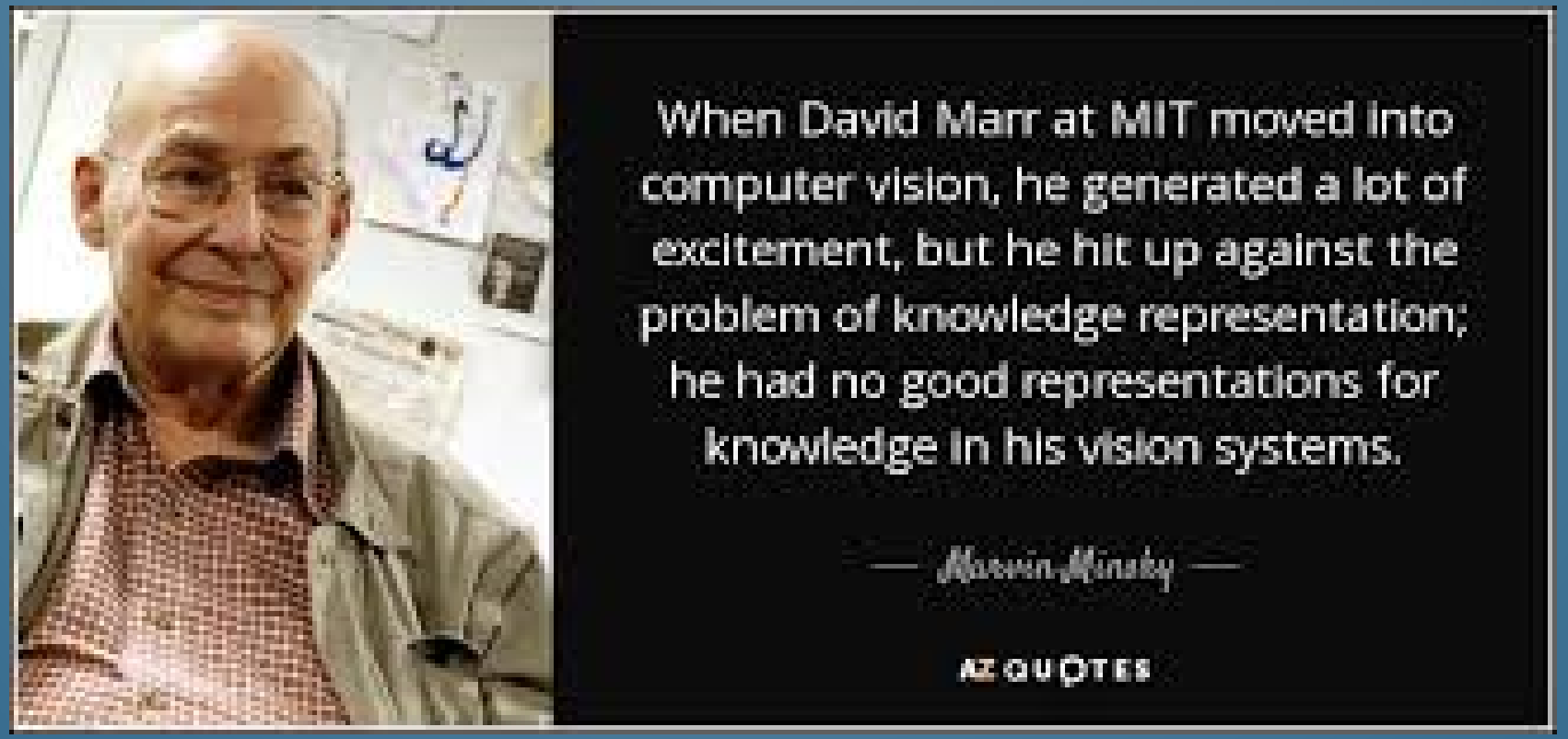
What representations can implement such computations?
How does the choice of representations determine the algorithm?



Implementational

How can such a system be built in hardware?
How can neurons carry out the computations?



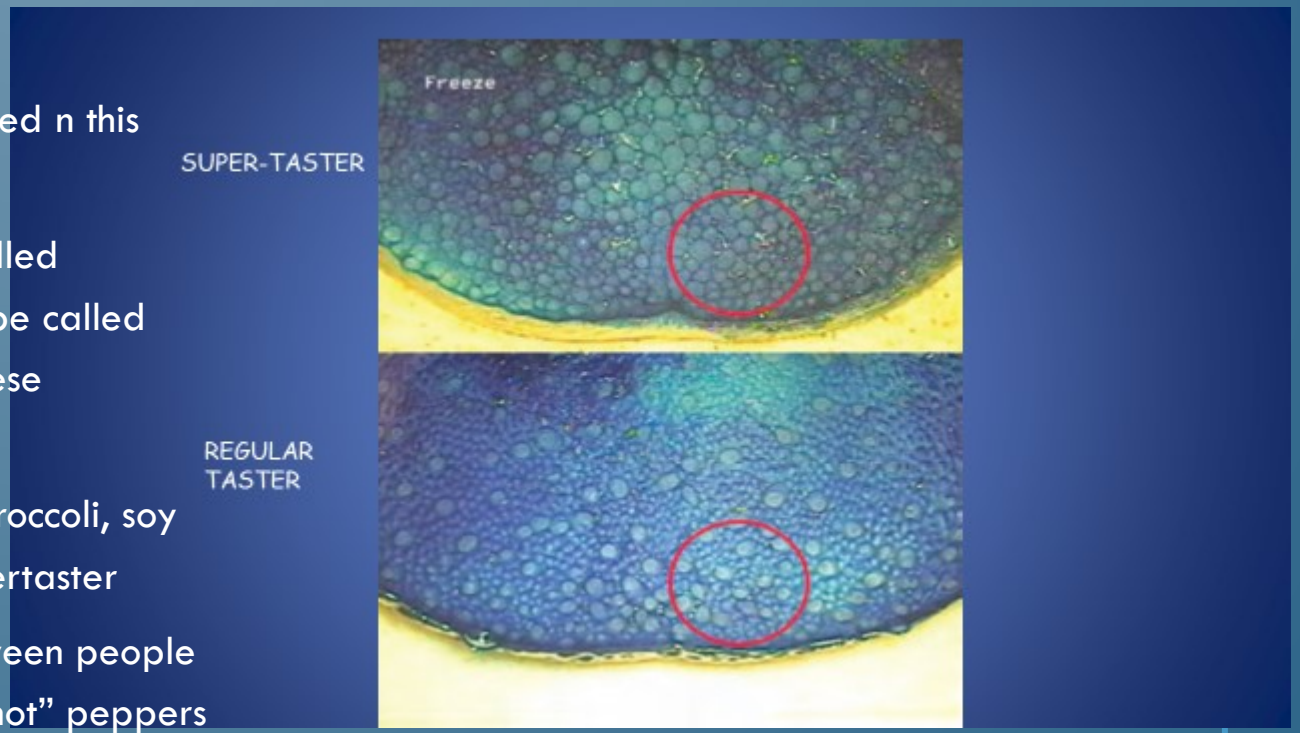

When David Marr at MIT moved into computer vision, he generated a lot of excitement, but he hit up against the problem of knowledge representation; he had no good representations for knowledge in his vision systems.
— Marvin Minsky —
AZ QUOTES

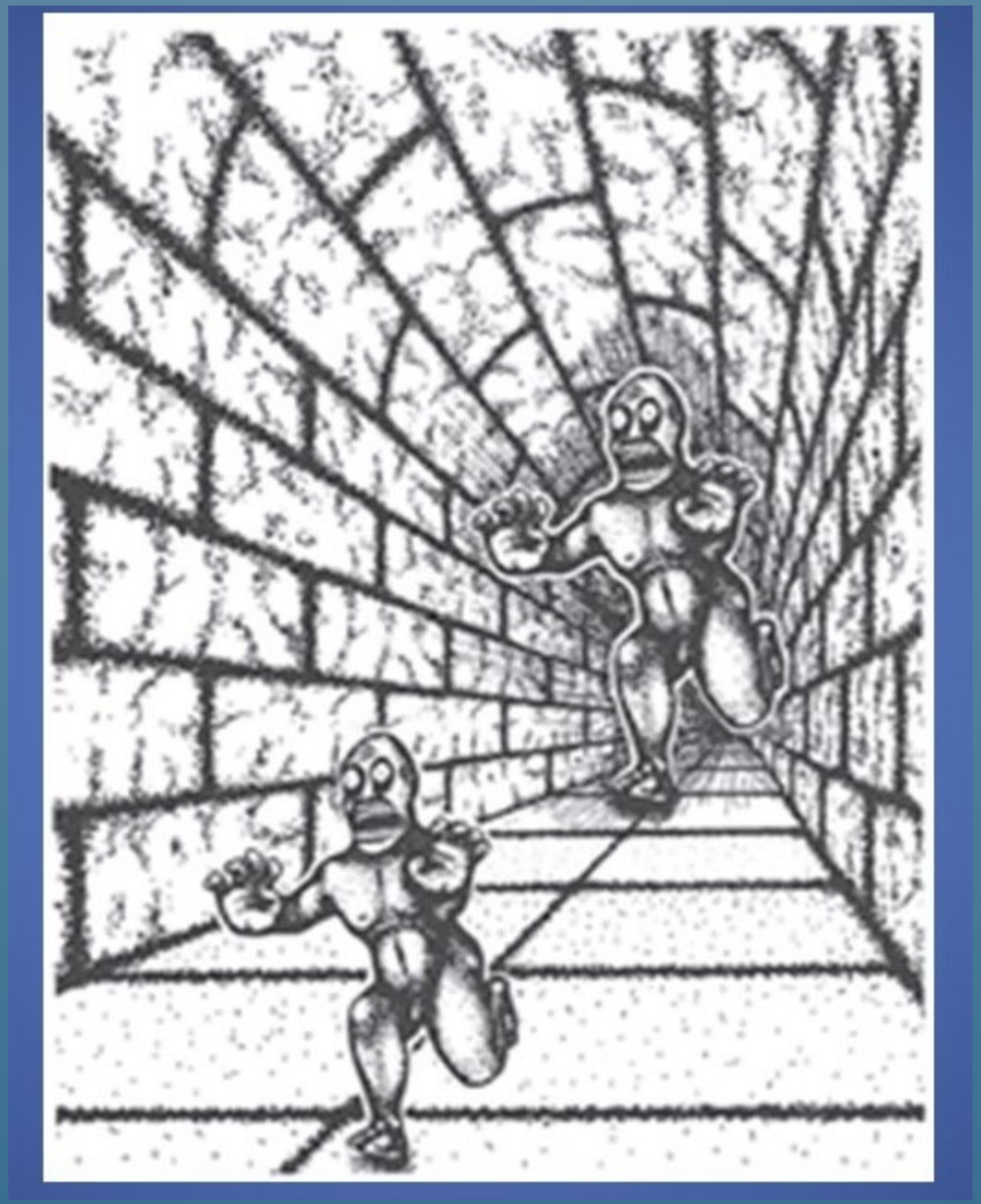
PERCEPTION AND REALITY

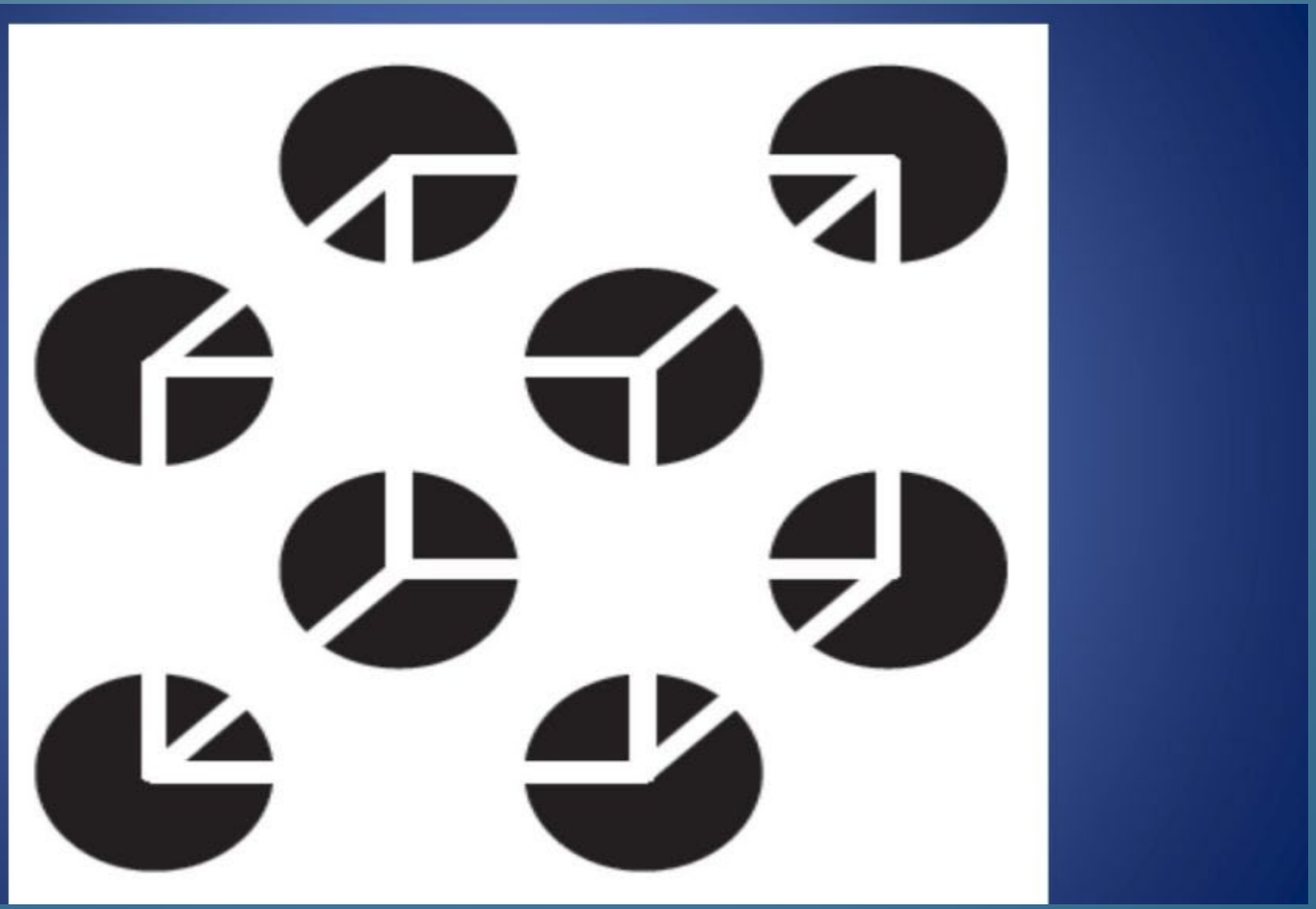
- what we think of as objective reality is not so objective
- Our perceptions of the world don't depend entirely on the physical features of the things we see and hear and feel and touch and taste
- The reality we experience also depends on the capabilities, limitations, and inherent characteristics of our sensory and perceptual systems
- In other words, you think you are in touch with reality, but in fact you are only in touch with *your* reality. And the reality you experience can be quite different from the one experienced by someone else

A MATTER OF TASTE

- There are genetic differences in the number of taste buds (grouped n this slide into papillae) that we have on our tongues
  - About 25% of the population have so few that they are called “nontasters,” while another 25% or so have so many as to be called “supertasters” (the rest of us are somewhere in between these extremes)
  - So if you are especially sensitive to bitterness, as in kale, broccoli, soy products, and grapefruit, for example, you might be a supertaster
  - Genetic differences also help account for differences between people in their experience of spiciness. Some people experience “hot” peppers as spicy, but delicious, while others experience them as incredibly painful and impossible to eat.







M. M. (MIKE MAY)

Vision restored after 53 years in 2000 by stem cell transplants

But a study published three years after the operation found that the then-49-year-old could see colors, motion and some simple two-dimensional shapes, but was incapable of more complex visual processing

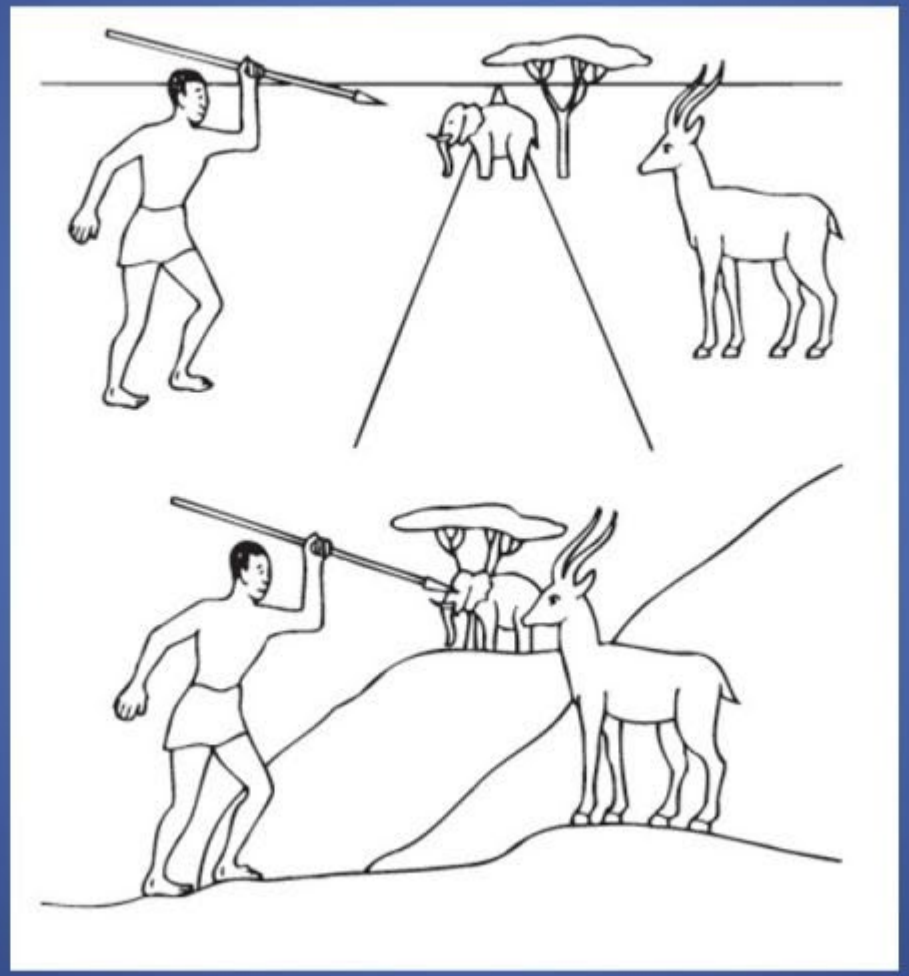
Ten years laterMay — referred to in the study as M.M. — continues to perform significantly worse than sighted control group participants.

The conclusion: May's vision remains very limited 15 years after the surgeries.

DISCUSSION

- Would you predict that everyone with normal sensory systems will experience their reality in the same way? Why or why not?

WHICH ANIMAL IS CLOSER TO THE HUNTER?



PERCEPTUAL REALITY

- the structure and principles of human perceptual systems tend to create generally similar views of the world for all of us, our perception of reality is also shaped by experience — including the culture in which we live (Boland, Chua, & Nisbett, 2008; Cramer, Dusko, & Rensink, 2016).

IT GETS WORSE

Just as supertasters experience foods differently than non-tasters because of genetics, each of us experiences the ‘same’ sights, sounds, events, and people differently depending on our learning histories, our personalities, our motivation, our emotional condition, and other factors.

QUEEN “ANOTHER ONE BITES THE DUST”

Perception vs. Reality

Common perceptual biases

- **Stereotyping**: assumptions about others based on belonging to a certain category or group
- **Halo effect**: one characteristic influences your overall evaluation of a person
- **Selective perception:** tendency to consider information that reinforces your existing beliefs

INATTENTIONAL BIAS

TEST YOUR PERCEPTION!

WHAT DOES THIS MEAN FOR VR?

We are developing a new kind of art that requires a new kind of perspective

Also, VR designers can take advantage of our perceptual biases to make visual tricks work

Point of view no longer works in its traditional manner, it is not fixed in the frame as in a painting

Our internal center is divorced from our external center and we lose sight of where we are

References

Bremner, A.J., Doherty, M.J., Caparos, S., de Fockert, J., Linnell, K.J., & Davidoff, J. (2016). Effects of culture and the urban environment on the development of the Ebbinghaus illusion. *Child Development, 87,* 962-981.

Coren, S., & Girgus, J. S. (1978). *Seeing is deceiving: The psychology of visual illusions*. Hillsdale, NJ: Erlbaum.

Fine, I., Wade, A. R., Brewer, A. A., May, M. G., Goodman, D. F., Boynton, G. M., et al. (2003). Long-term deprivation affects visual perception and cortex. *Nature Neuroscience, 6,* 915–916.

National Highway Traffic Safety Administration. *Traffic safety facts: distracted driving 2016*. Washington, DC: US Department of Transportation, National Highway Traffic Safety Administration, April, 2018. Publication No. DOT-HS-812-517.

Simons, D. J., & Ambinder, M. S. (2005). Change blindness: Theory and consequences. *Current Directions in Psychological Science, 14,* 44–48.

Vokey, J. R. (2002). Subliminal messages. In J. R. Vokey & S. W. Allen (Eds.), *Psychological sketches* (6th ed., pp. 223–246). Lethbridge, Alberta, Canada: Psyence Ink.

Vokey, J. R., & Read, J. D. (1985). Subliminal messages: Between the devil and the media. *American Psychologist, 40,* 1231–1239.

BREAK

SAVE US OED!

reality, n.

I. The quality or state of being real.

real, adj.[2], n.[2], and adv.

A. adj.[2] **I.** That actually exists, or relates to this. **1. a. Having an objective existence; actually existing physically as a thing, substantial; not imaginary.**

B. ***Philosophy*. Designating whatever is regarded as having an existence in fact and not merely in appearance, thought, or language, or as having an absolute and necessary, in contrast to a merely contingent, existence.**

1989 *Brit. Jrnl. Philos. Sci.* **40** 429 The world of the physical sciences is a world of entities endowed with the 'real' or primary qualities of mass, figure, motion, etc.

exist, v.

1. To have reality or being.

a. intransitive. To be real or actual; to be a part of objective reality. Also: spec. (Logic) (of a property or kind of thing) to have instances, to be exemplified.

OED

Oxford English Dictionary

The definitive record of the English language

Thanks OED!!! That is a circular definition!

WARNING: MEDIA STUDIES AHEAD!

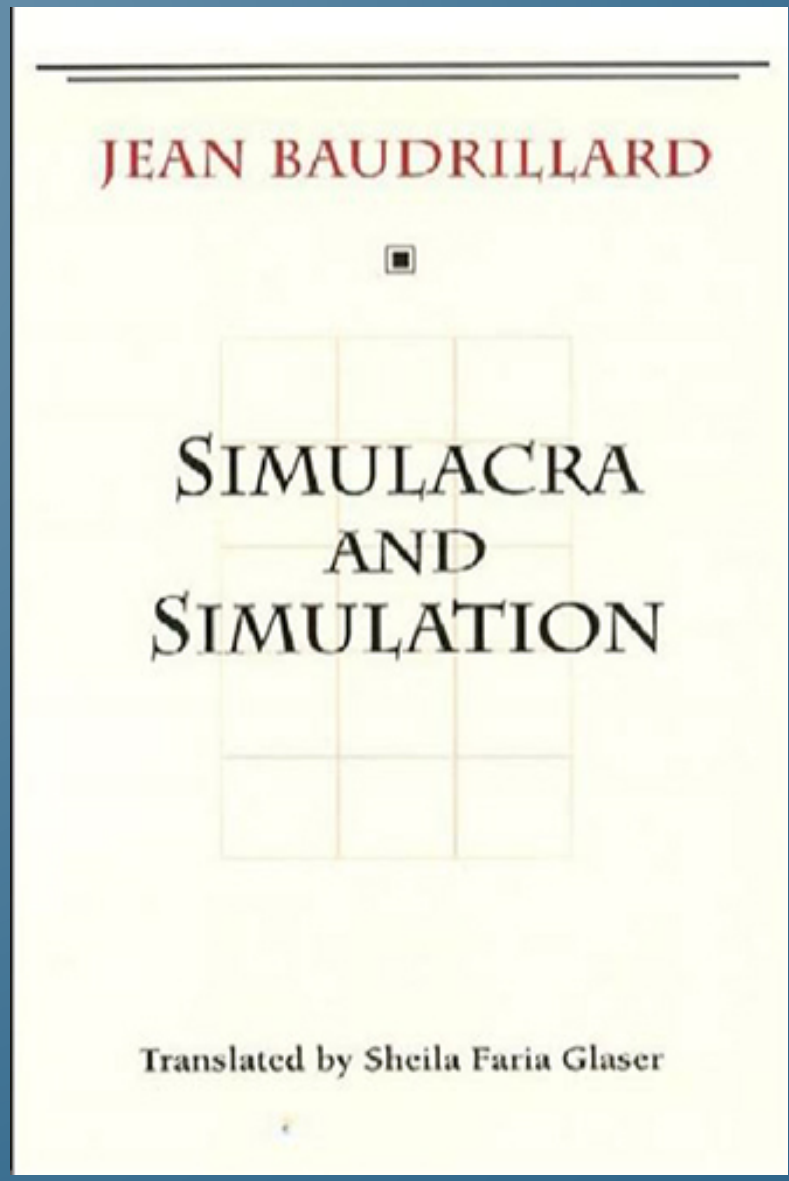
HYPERREALITY

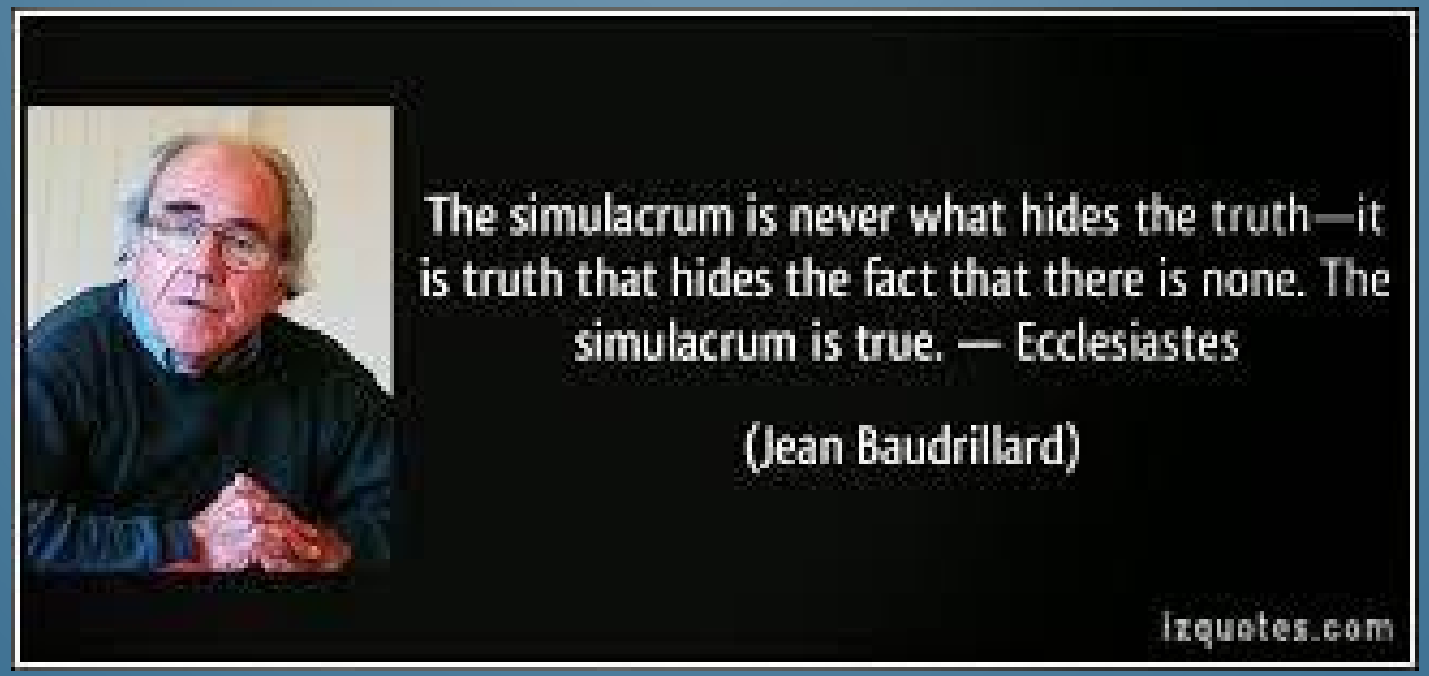
The slippage of reality, its elusiveness encountered even in a basic search for a definition, is an element of the hyperreal – a condition in which the distinction between the ‘real’ and the imaginary implodes.

- A general understanding of hyperreality is important for it is an issue at the crux of several critical debates within the study of media including semiotics, objects and space, the spectacle, performativity, the examination of mass media, Platonism, resistance, and the structure of reality.

SIMULACRA AND SIMULATION

The simulation is characterized by a blending of ‘reality’ and representation, where there is no clear indication of where the former stops and the latter begins. The simulacrum is often defined as a copy with no original, or as Gilles Deleuze (1990) describes it, "the simulacrum is an image without resemblance" (p. 257). Jean Baudrillard (1994) maps the transformation from representation to simulacrum in four ‘successive phases of the image’ in which the last is that "it has no relation to any reality whatsoever: it is its own pure simulacrum" (SS p.6). (see mimesis, representation)




The simulacrum is never what hides the truth—it is truth that hides the fact that there is none. The simulacrum is true. — Ecclesiastes
(Jean Baudrillard)
izquotes.com

SIMULACRA AND SIMULATION

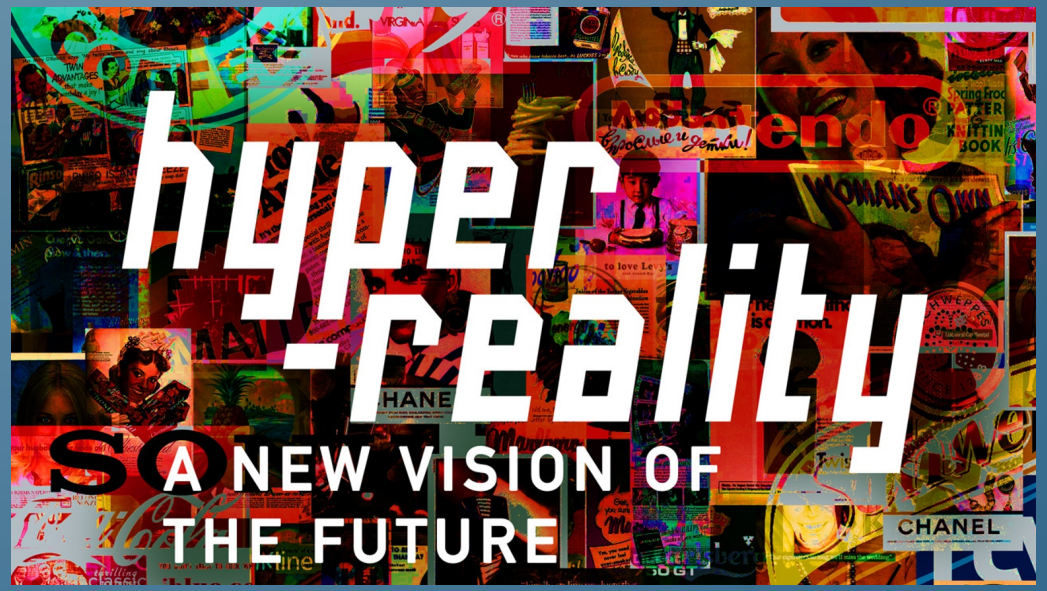
Deleuze, Baudrillard, and several other theorists trace the proliferation and succession of simulacra to the rise of hyperreality and the advent of a world that is either partially, or entirely simulated.

SIMULACRA AND CAPITALISM

Frederic Jameson (1990) contends that one of the conditions of late capitalism is the mass reproduction of simulacra, creating a "world with an unreality and a free floating absence of "the referent"' (p. 17).

EVOLUTION OF THE HYPERREAL

- Although theorists highlight different historical developments to explain hyperreality, common themes include the explosion of new media technologies, the loss of the materiality of objects, the increase in information production, the rise of capitalism and consumerism, and the reliance upon god and/or 'the center' in Western thought. Essentially, certain historical contingencies allow for the wide scale reproduction of simulacra so that the simulations of reality replace the real, producing a giant simulacrum completely disconnected from an earlier reality; this simulacrum is hyperreality.

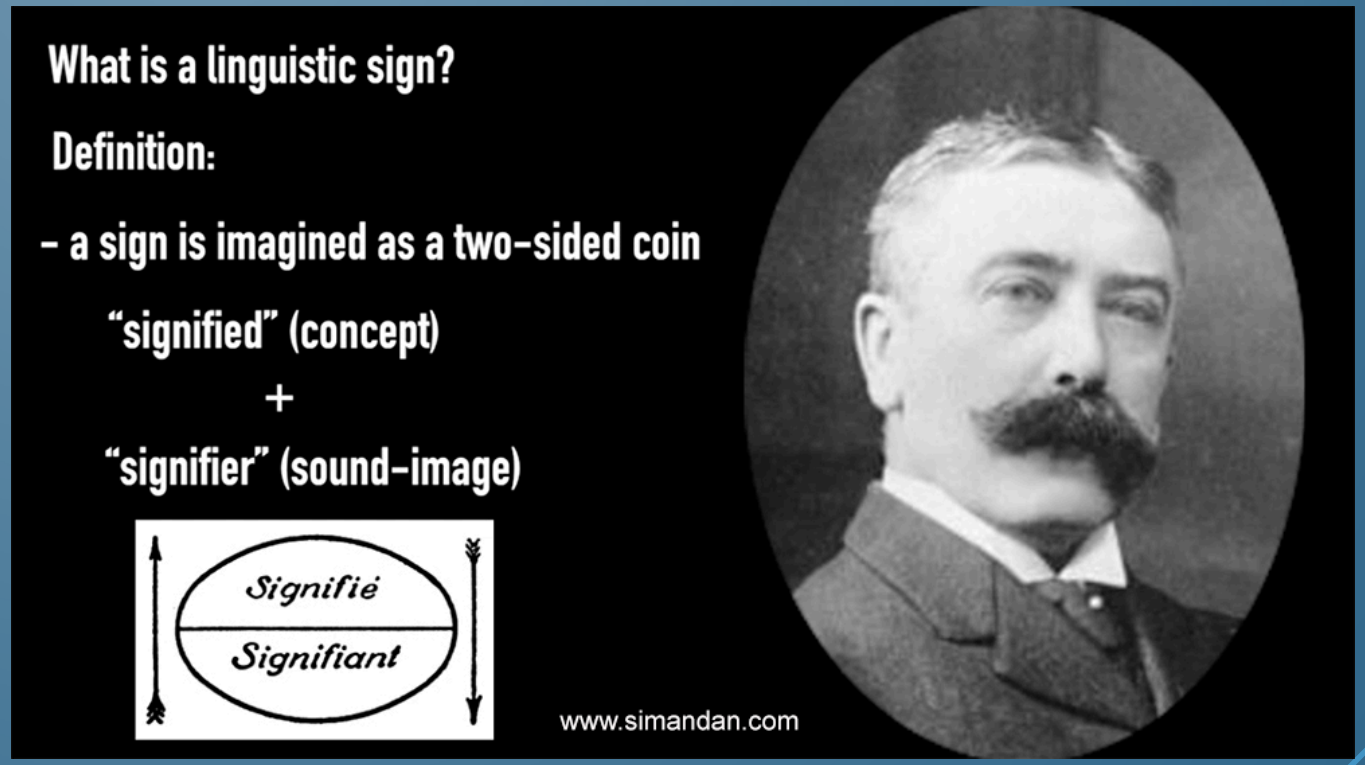


LIFE IN HYPERREALITY

- We live in logos the way fish live in water

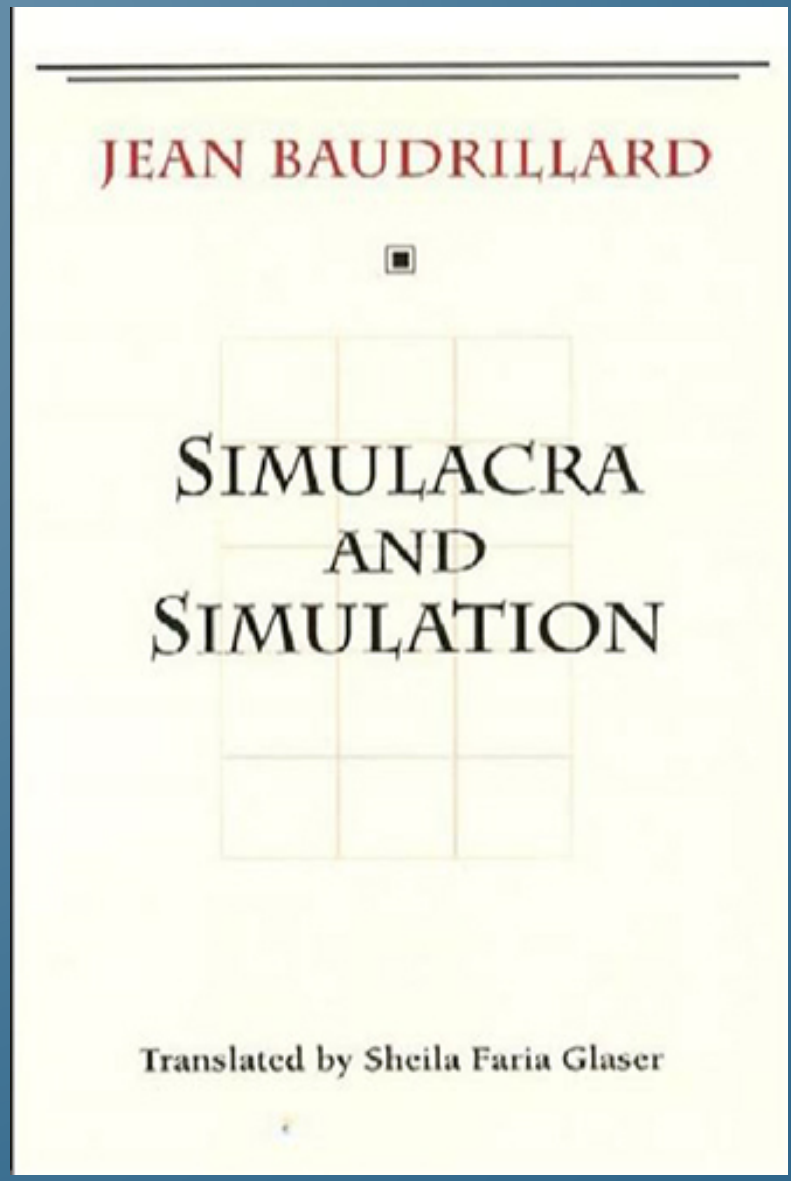
FERDINAND SAUSSURE

- The mass simulacrum of signs become meaningless, functioning as groundless, hollow indicators that self-replicate in endless reproduction



SIMULACRA AND SIMULATION

Baudrillard (1981) claims the Saussurian model is made arbitrary by the advent of hyperreality wherein the two poles of the signified and signifier implode in upon eachother destroying meaning, causing all signs to be unhinged and point back to a non-existing reality (180).



PAUL VIRILIO (1932-2018)

Paul Virilio's *The Lost Dimension*, in which he argues that modern media technology have created a "crisis of representation" where the distinctions between near and far, object and image, have imploded (p. 112).

PAUL VIRILIO (1932-2018)

Virilio locates the ‘vacuum of speed’ as the historical development which produces technology that overturn our original understanding of spatial relations by altering our perceptions. This machinery "gives way to the televised instantaneity of a prospective observation, of a glance that pierces through the appearances of the greatest distances and the widest expanses" (p. 31).

PAUL VIRILIO (1932-2018)

What I'm trying to show is the really powerful character of the images that are produced everywhere around us and that no one is analysing. Because images have become munitions. Their delivery and impact have the same speeds as the impact of a bullet. The arms [weapons; BO] of the future will much more resemble a TV than a mortar.

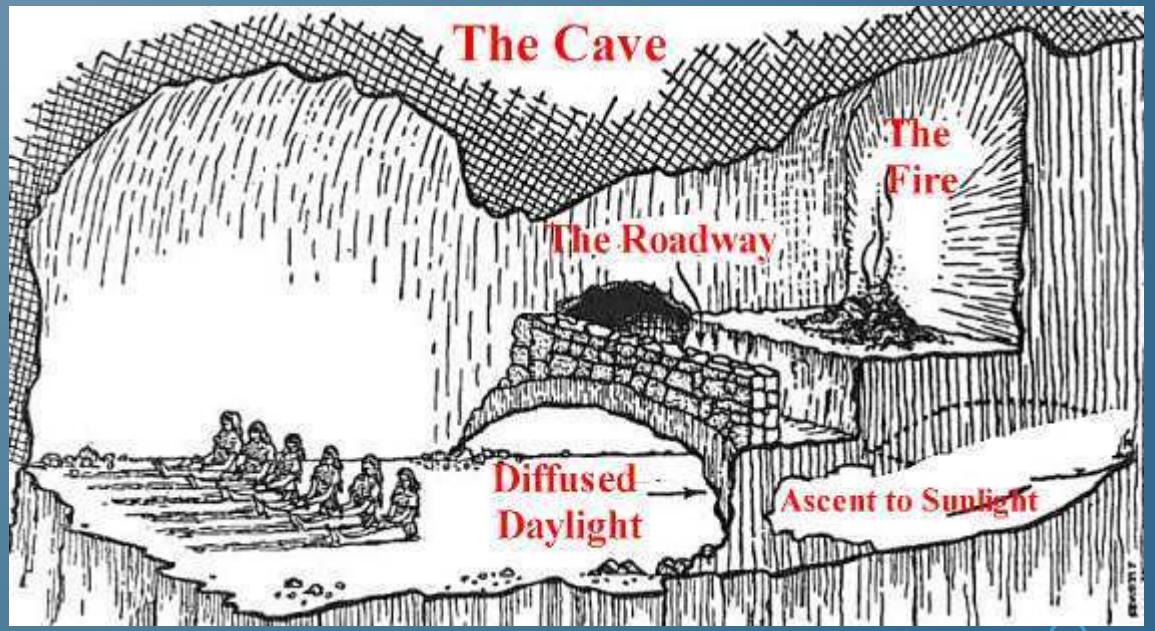
From an interview with John Armitage, in *Virilio Live: Selected Interviews*, Sage, London, 2001, p. 119):

MONEY IS HYPERREAL

- Barter-common goods-pecuniary units (*pecus* "cattle" exchange)-monetary units (gold standard)-monetary units (without standard)-monetary units (digital credit database)-crypto currency (bitcoin)
- During the process of countless successive copies the essential reality of exchange has long since been lost, with commodities now completely disconnected from their use value, their production cost, and even their function. Moreover, the foundational lie of exchange has long since been forgotten over the weight of countless simulacra: that there was never any trade grounded in reality, that symbolic exchange is precisely and only that which can only refer to other signs for meaning and definition.

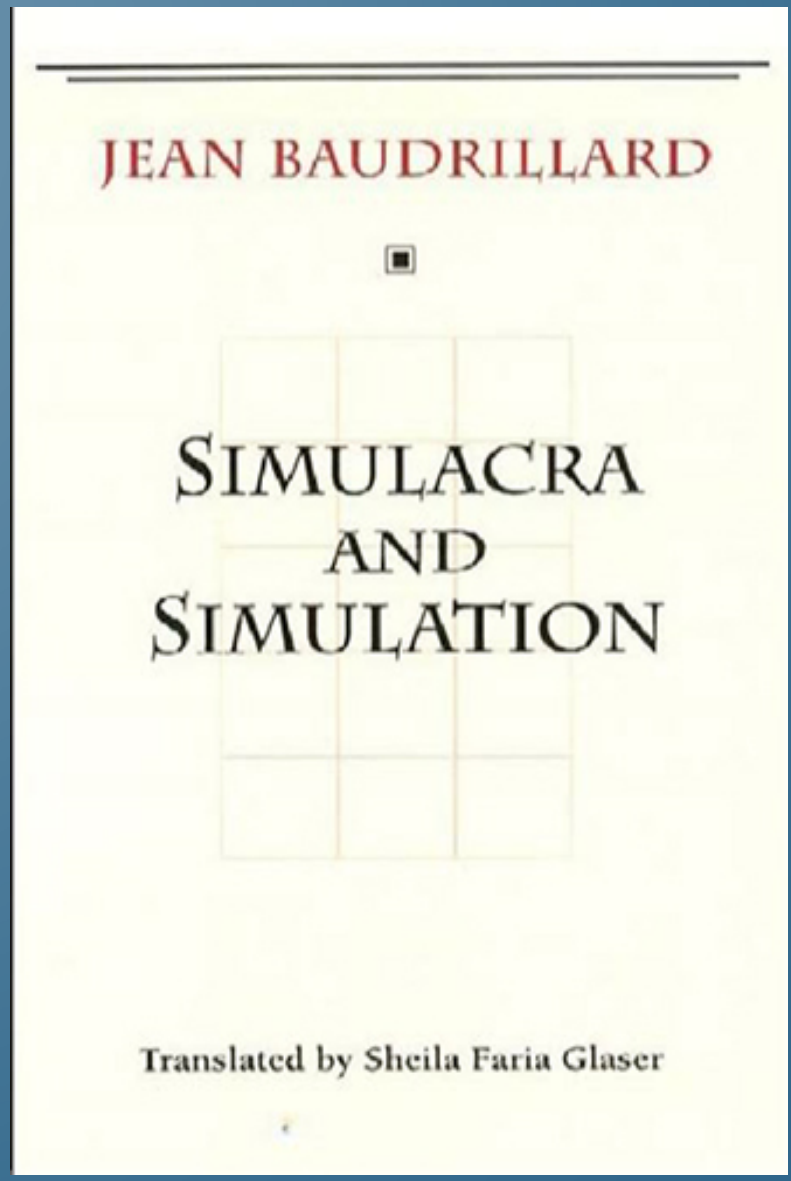
CUT BACK TO PLATO

- Deleuze argues that Plato contrasts these legitimate copies to fearful simulacra, "Plato divides in two the domain of images-idols: on one hand there are copies-icons, on the other there are simulacra-phantasms" (p. 256). It is thus that Deleuze is able to claim that with the arrival of hyperreality Platonism has been reversed, for any original truth or ideal forms that provided the anchor for representation have since been permanently lost in the reproduction of simulacra and the construction of a hyperreality without any connection to the real.



SIMULACRA AND SIMULATION-RESISTANCE!

Baudrillard's proposal for resistance is radical but clear: obliterate the transmitters, destroy the world of media technologies through revolutionary action and resume normal face to face conversation (1981: p. 170).



JUDITH BUTLER

- Judith Butler, to reverse certain performative signs in a subversive manner around the body so as to expose, reveal, and de-familiarize specific media technologies– to dress in drag in order to denaturalize simulated norms of sex and gender.

WHAT IS REALITY?

- Gilles Deleuze and Felix Guattari (1983) understand desire to be based upon the lack of the object, yet nonetheless a productive force that renders into reality the fantasy of that object. ‘Reality’ is thus nothing more than a "group fantasy" reified by ‘desiring machines, for "desire produces reality, or stated another way, desiring-production is one and the same thing as social production" (p. 30).

WHAT IS REALITY?

- Baudrillard represents many of the hyperrealists with his claim that the real is "fictional," a phantasy generated by "doubling the signs of an unlocatable reality" (1994: p. 81). Baudrillard concludes on reality that it is nothing more than a fairy tale, it is "now impossible to isolate the process of the real, or to prove the real" (1994: p. 21).