COMP210: Interfaces & Interaction

3: Presence

Learning outcomes

- Define presence in the context of virtual reality
- Identify a range of illusions and their roles in achieving a sense of presence
- Describe the way in which the brain processes & responds to stimuli

“We see things not as they are, but as we are - that is, we see the world not as it is, but as moulded by the individual peculiarities of our mind”

- Philosopher, G.T.W Patrick. (1890)

Reality is malleable.

Our point of view is inseparable from our understanding of reality.

Figure: The Lawn Mower Man - 1992

Duck Test

"a colloquial name for a method of testing if an experiencer has reached a state of presence, by monitoring their behaviour when threatened by a virtual object"

- VRGlossary.org

This could have an adverse effect if the experiencer realises that there is no actual risk - Presence is then broken.

Presence (again)

`Presence is the psychological state of subjective perception in which even though part or all of an individual's current experience is generated by and/or filtered through human-made technology, part or all of the individual's perception fails to accurately acknowledge the role of the technology in the experience.'

International Society for Presence Research, 2000

(ISPR Website)

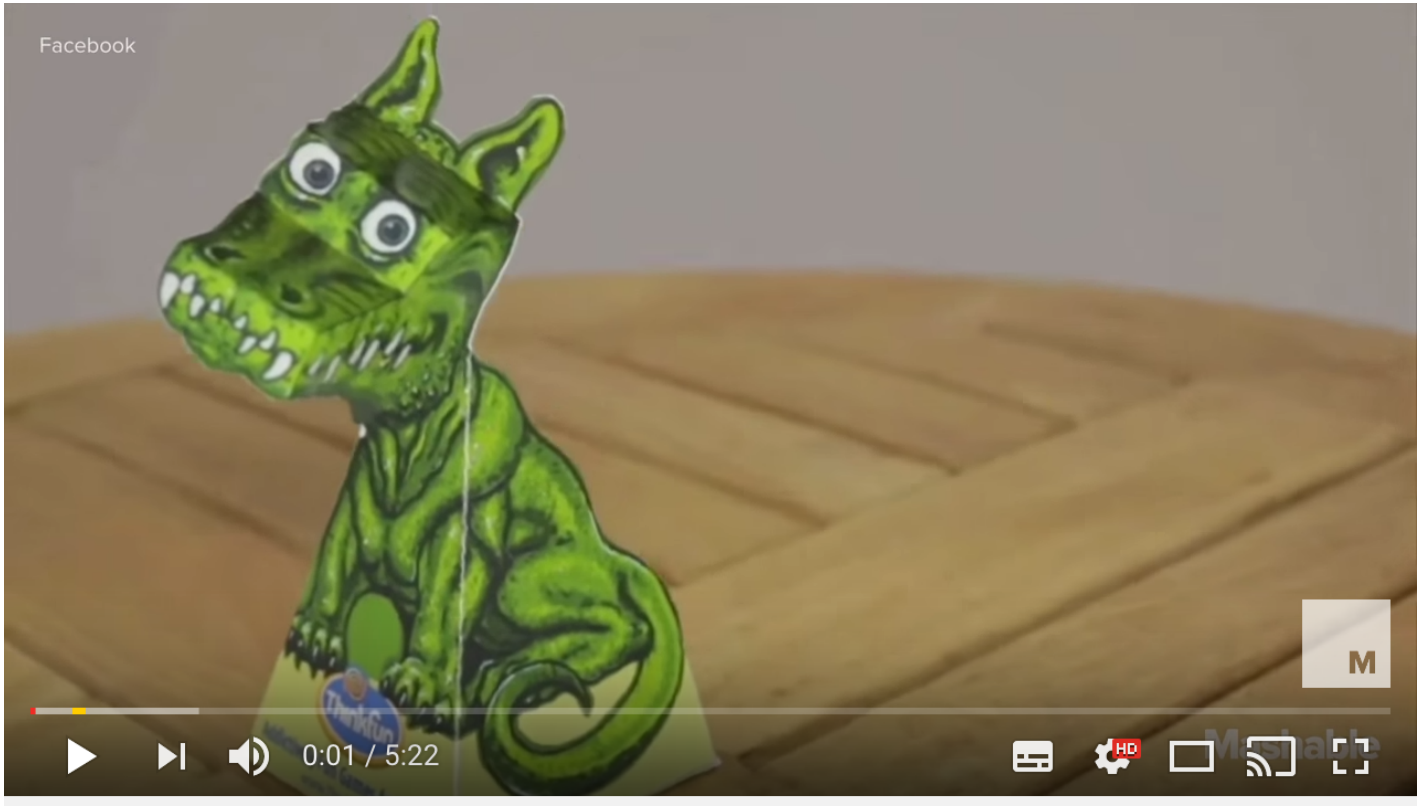

Figure: Michael Abrash, the chief scientist for Facebook's Oculus

Activity

Who can find the best optical illusion?

Post results to Slack

Types of Illusion

- Boundary Completion
- Blind Spot (link to eye)
- Depth Illusions - Trompe-l'œil
- Afterimage
- Motion Illusions - Watch these in VR as they cause motion sickness.

Illusions

V/AR are illusion based experiences

There are four main components to this illusion:

- the stable spacial place,
- self-embodiment,
- physical interaction &,
- social communication.

Sensation vs. Perception

Sensation - Lower level recognition of stimuli.

Perception - Higher level processing that combines information from the senses, filters it, organises it then interprets it to create **subjective**, conscious experience.

Reality is Subjective

By this point we are starting to get a sense that what we perceive is not necessarily real.

So what is getting in the way of reality?

Iterative Processing

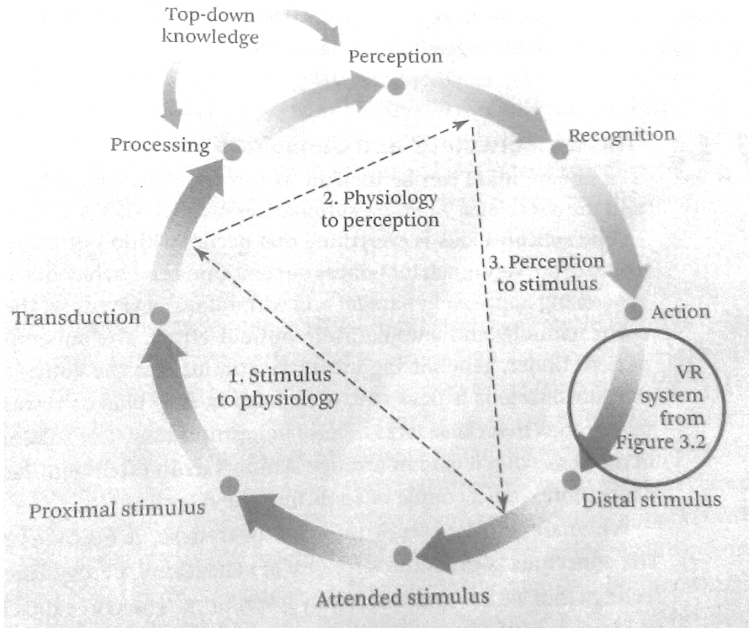

Figure: We continually receive, process and perceive stimuli in an iterative loop

Neuro-Linguistic Programming (NLP) - Communication Model

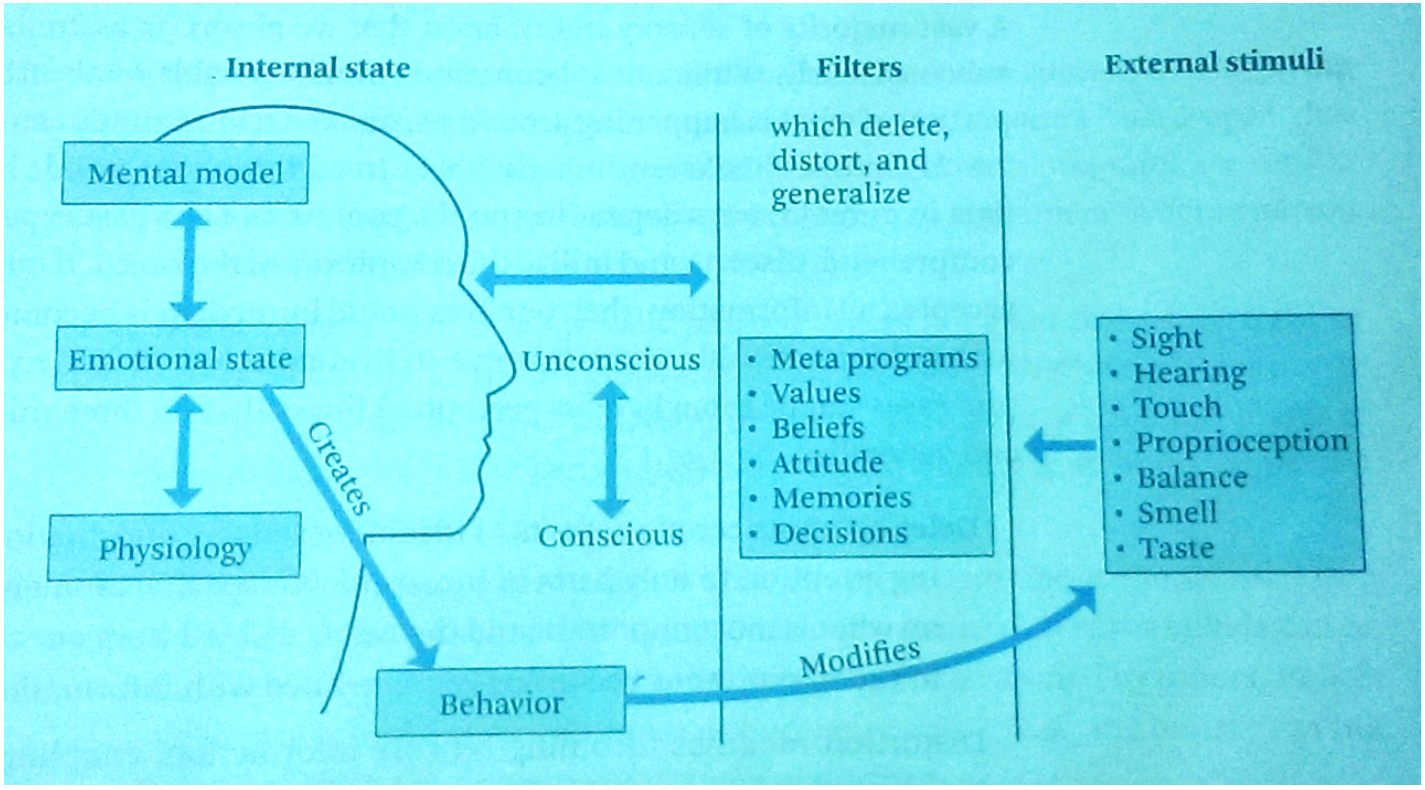

Figure: The NLP communication model is one way to describe how we as humans respond to external stimuli.

External Stimuli.

External stimuli is perceived through the sensory input channels.

Most people have a dominant sensory modality.

People do most of their thinking through there preferred modality/

“So a visual person thinks more with pictures than an auditory person, who thinks more with sounds.” - Jason Jerald

Filters

Our Subconscious does the majority of filtering.

Past experiences alter the we understand stimuli in the present.

There are three main types of filter:

- Deletion - delete unimportant incoming stimuli so we can focus on whats important.
- Distortion - alter our perception of incoming stimuli based on our environment and passed experience.
- Generalisation - draw global conclusion and help the user build their **unconscious competence**

Filters cont.

Specific filters in order on the conscious awareness:

- Meta Programs
- Values
- Beliefs
- Attitudes
- Memories
- decisions

Internal State

Thoughts are created from incoming filtered incoming stimuli and form internal representations.

Sensory perceptions are formed that may or may not be true to the original stimuli.

Emotional States are then triggered which in turn trigger physiological states and this is the motivation behind human behaviour.

Possibly maybe!

The Uncanny Valley

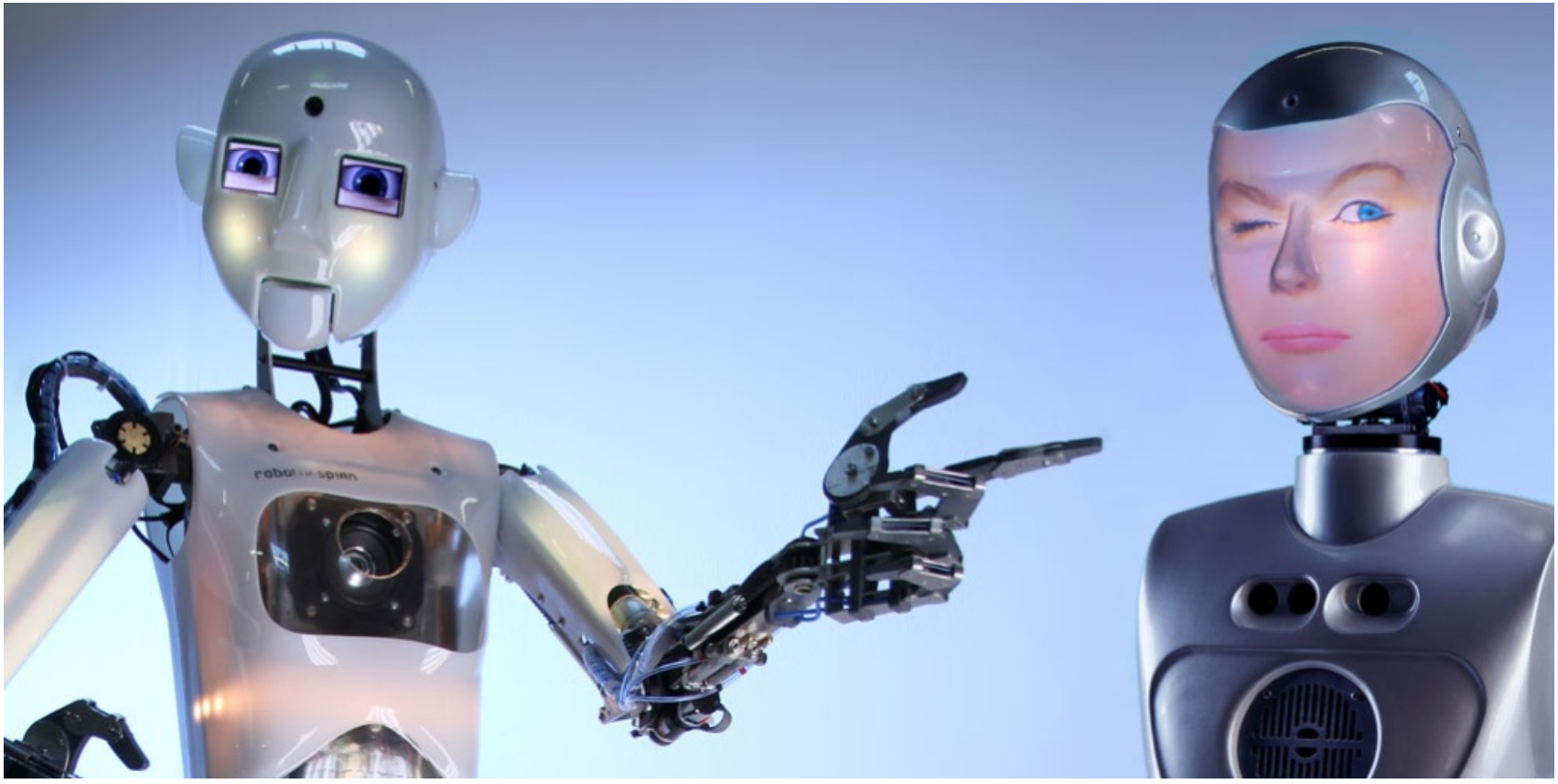

Figure: Engineered Arts - Penryn

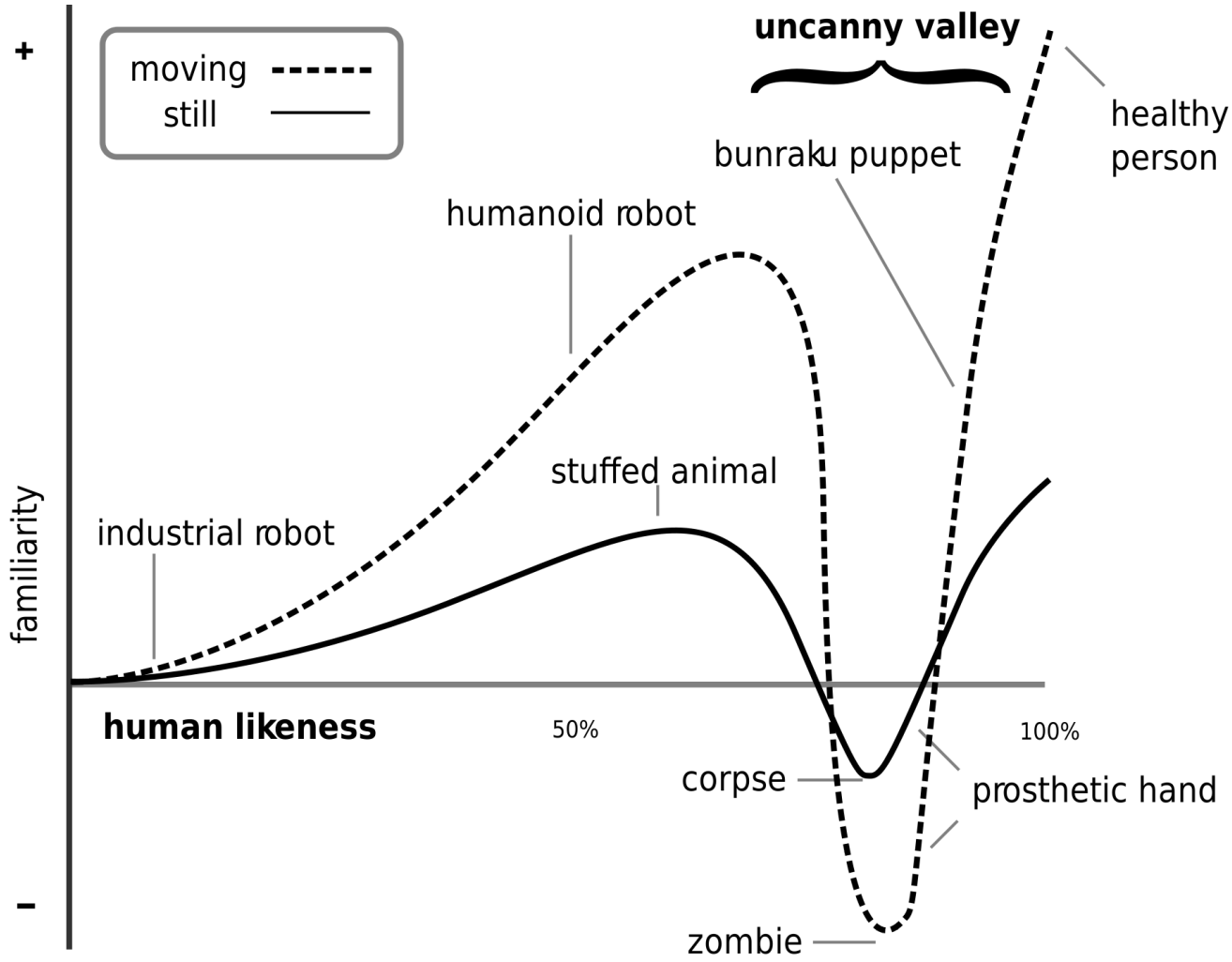

Figure: Masahiro Mori -

Fidelity Continua

The notion of the uncanny valley applies to aspects of VR as well. These components have been defined as the Fidelity Continua.

- **Representation** fidelity - Hyper-realistic to abstract and non-objective worlds.
- **Interaction** Fidelity - Degree to which a interaction in VR corresponds with the same interaction in the real world.
- **Experiential** Fidelity - The degree to which the user experience matches the intentions of the VR creator. Procedural worlds have a very low experiential fidelity.

What do we want from V/AR?

Some aim to recreate reality to the highest fidelity.

Others seek to surpass it.

Misdirection

"That which directs a spectator away from the method and towards the effect"

Curtis Hickman - Magician & founder of THE VOID.

TRUTH/REALITY >GUIDED PERCEPTION >LIE/FANTASY

LINK

Sensory Substitution

Sensory substitution is the replacement one sensory cue that is not yet able to be simulated with one that is.

- Ghosting - showing the user a second version of a virtual object.
- Highlighting - Visual signifiers that convey a sense of interactivity with an object.
- Audio cues - Useful for identifying collisions with virtual objects.
- Passive haptics - Real world reference frames meet virtual reference frames to help a user navigate a space.
- Rumbles/sub packs - Again, used to portray a collision with virtual objects.

Redirected Walking

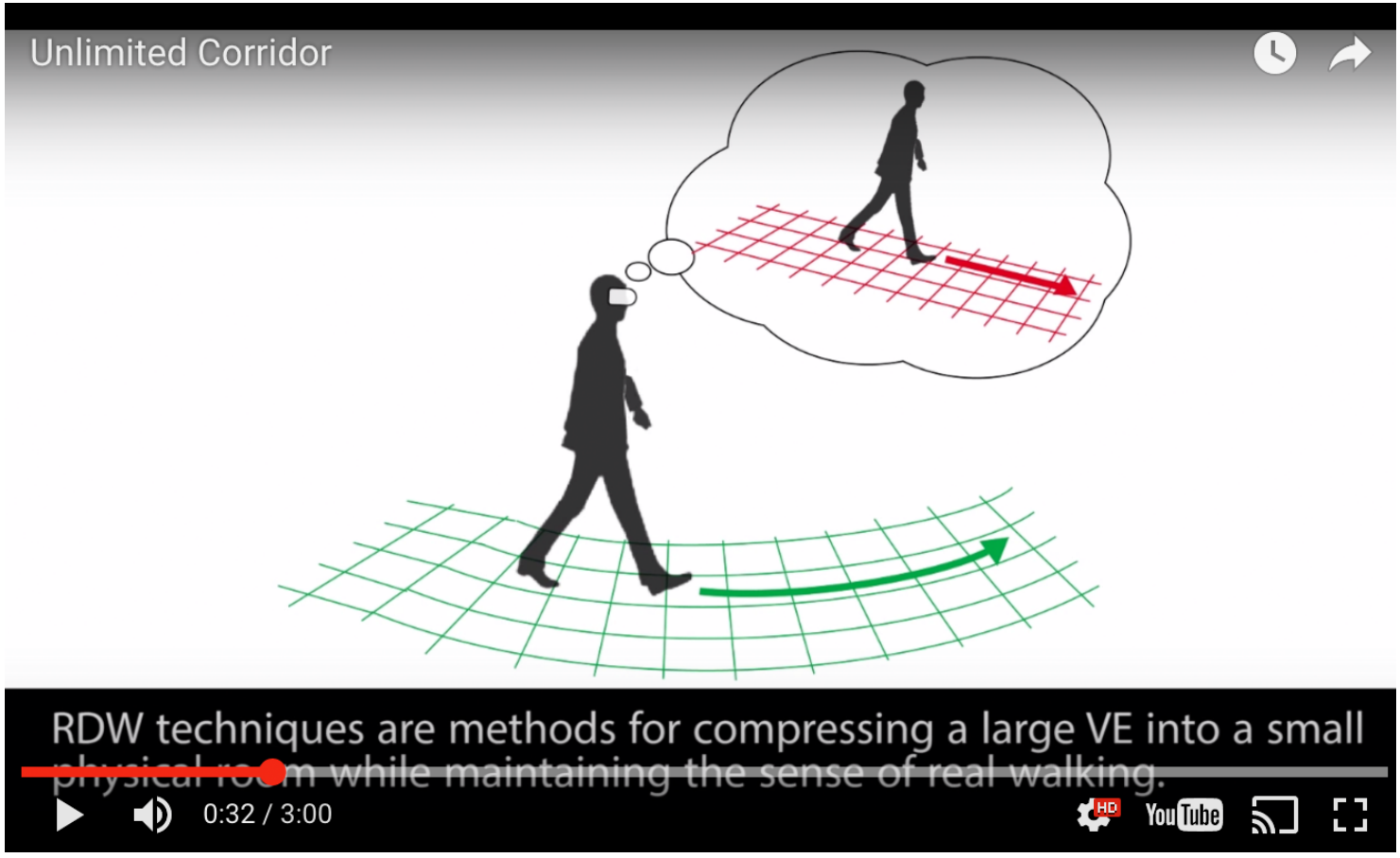

Figure: "HUMANS, QUITE SIMPLY, suck at walking in straight lines" - Wired Magazine