FCSH FACULDADE DE CIÊNCIAS SOCIAIS E HUMANAS UNIVERSIDADE NOVA DE LISBOA

Immersion Issues in Haptic Experiences

GAME-ON®'2018
September 18-20, 2018, Abertay University,
Dundee, Scotland, United Kingdom

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- New practices in a new paradigm
- Conceptual problems
- Newtonian vs. Einsteinian worlds
- From Euclidean to Minkowski's Geometry
- Minkowski's & Einsteinian theories in games
- Body & space – a new atlas of the brain – new relationships between body and brain
- Proprioception & haptic technology
- Mismatching & warping issues – probable solutions

New practices in a new paradigm

- new storytelling strategies do not fit within the existing literary conventions and categories
- go beyond the scope of Interactive Fiction or Game models
- all kinds of storytelling need a ´referent' (external world)
- could be considered the narratological/linguistic approach
- appropriate interpretation of (any) TEXT depends on CO-TEXT and CON-TEXT

Context(s)

verbal & non-verbal environment (of speech, of fictional worlds)

1. linguistic - **co-text** - (McCarthy)

2. Situational - non-verbal - immediate environment of speech (Saussure, Halliday, Hymes)

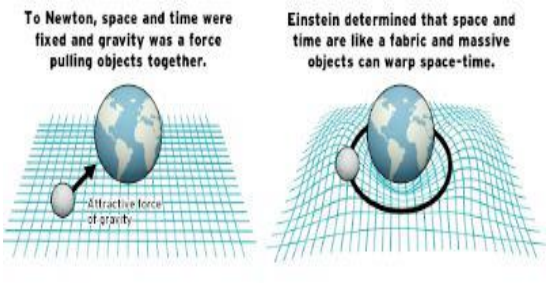
3. Cultural - general, non-verbal, permanent environment of speech including background cultural knowledge (Hymes)

if any of these elements change - interpretation changes

New world frames

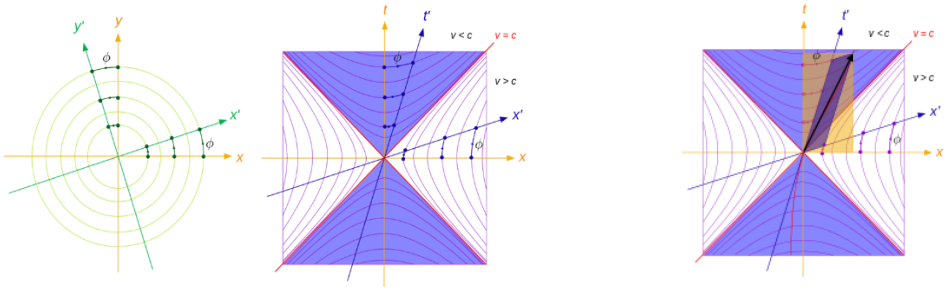
- Problems addressed as in a Euclidian-Newtonian world while in a Minkowki-Einsteinian space-time
- Do not yet consider the more recent developments in Brain Studies, Cognitive Sciences, and Physics
- Both these issues are changing the concepts of Man, space, and human-space interaction
- Demand a terminology not theory-laden or obsolete

Newtonian vs. Einsteinian worlds



moving 3D objects are really successive cross sections of immobile 4D objects

From Euclidean to Minkowski's Geometry



- In "Minkowski geometry (Fig. 2) there is an extra dimension (coordinate X0) derived from time - viewed from any inertial reference frame
- From a dynamic perspective, there is mutual interference (Fig. 3): the angled x' line in the image follows the line of simultaneity at event 0 for worldline t'.:

Minkowski's & Einsteinian Games

- Velocity Raptor (2011) TestTube
- OpenRelativity (2012) MIT Game Lab
- A Slower Speed of Light (2013) MIT Game Lab
- Relativity Wars (2015) FunGameCo
- The Hyperbolic Games 2.0 4+ (2018 Jeff Weeks)

Body & space

- new atlas of the human brain redefining its characteristics, areas and functions
- sex differences in the adult human brain
- a new atlas of the relationships between body and brain
- new theories being developed synthetizing top-down and data-driven bottom-up approaches
- ‘five senses’ are being re-defined and studied at different paces (vision more advanced)

Body & space - proprioception

- relative position of one's own parts of the body and strength of effort being employed in movement
- the ability to sense stimuli arising within the body regarding position, motion, and equilibrium

Haptic technology

- gadgets that enhance/replace bodily functions – prosthesis, external accessories, wearable – belonging to the environment
- employed to allow the human body to interact with Augmented, Mixed or Virtual Reality surroundings
- studies about VR or AR fictional 'immersion' ignore narratological (Omniscient Narrator) and aesthetical issues

Mismatching & warping

- not attaining a perfect coincidence of places and shapes between the real and virtual object
- lead to poorer sense of presence = loss of (narratological) verisimilitude
- decreased (technical) manipulation performance during interaction
- issues are being corrected via Euclidean/Newtonian dimensions
- subjects resort to vision (visual dominance in haptic experiences)

Conclusion

- new world(s) paradigm – Minkowski-Einsteinian worlds, Brain studies – affect the concepts of world, body, human-space and human-computer interactions
- mismatching and warping in haptic experiences might result from resorting to out-dated algorithms
- the dis-connections between gadget users and AR/VR have to be disentangled without human/vision help
- solving this basic issues may contribute to a faster development of extant and new gadgets

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Thank You

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