



# **RV - AULA 01 - PSI3502/2018**

Realidade Virtual: Introdução



## Objetivos

Encontrar uma definição de RV;

Discutir as propriedades que definem os ambientes virtuais e de realidade virtual;

Entender os conceitos de imersão e interatividade;

Analisar as propriedades gerais compartilhadas por todos os sistemas de RV.

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# O que é Realidade Virtual?



<https://thinkmobiles.com/blog/virtual-reality-companies/>

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Is it always a 3D-rendered world?

Does it require special hardware like  
Powergloves or Data Suits  
to interact with virtual environments?

Do text-based virtual communities  
represent true virtual environments?



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Are MMO games VE?

Are 3D movies a VR experience?

What is the basic minimal set of properties that a system needs to have in order to be considered a VR?





## Perception of reality

We cannot discuss reality without discussing the **perception** of reality.

This perception is shaped by our **mind** and our **senses**.



## Altering perception of reality

Two ways of altering one's perception of reality:

To **trick the mind** and alter the way it processes the data it receives from senses.

- drugs
- alcohol
- pathological conditions
- hypnosis
- autosuggestion

To **trick the senses** and somehow change the data that they transmit to the brain.





## Goal of VR

Alter one's perception of reality by **tricking the senses**, by providing artificial computer-generated stimuli.

Create a perfect illusion.

However, tricking senses is much harder than tricking the mind.



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## Virtual Environments

Virtual environments provide the **illusion of presence** in a place different from one's current physical surrounding, potentially a non-existent or a real place situated at a different physical location or a point of time.



<https://www.christiedigital.com/en-us/3d/virtual-simulation/virtual-reality-simulator/cave-automatic-virtual-environment>

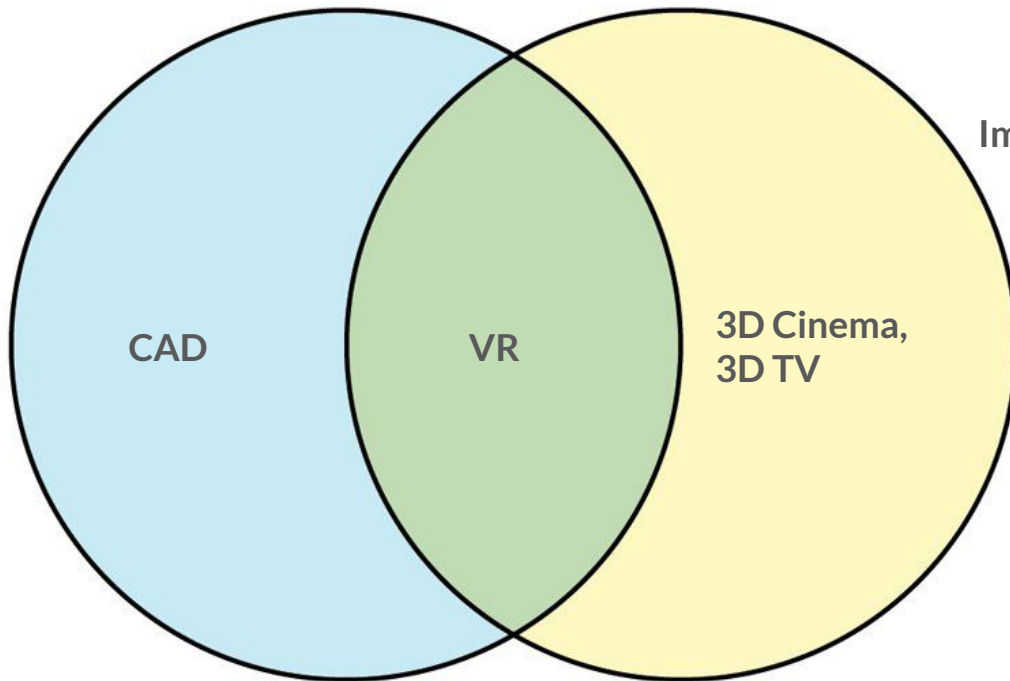


## Virtual Reality and other media

Michael R. Heim, in his book *The Metaphysics of Virtual Reality*, identifies several different properties of virtual reality such as: **immersion**, **interaction**, stimulation, artificiality, telepresence, full-body immersion, network communication, etc.



Interaction



Immersion



# Immersion

Sense of presence in a virtual environment.

Technologically more advanced systems do not always offer a better sense of immersion.

Immersion is a quality of user experience and a multimodal experience.



## **Multimodal Experiences**

Usage of more than one mode of behavior or action.

In a virtual environment: more than one human sense.

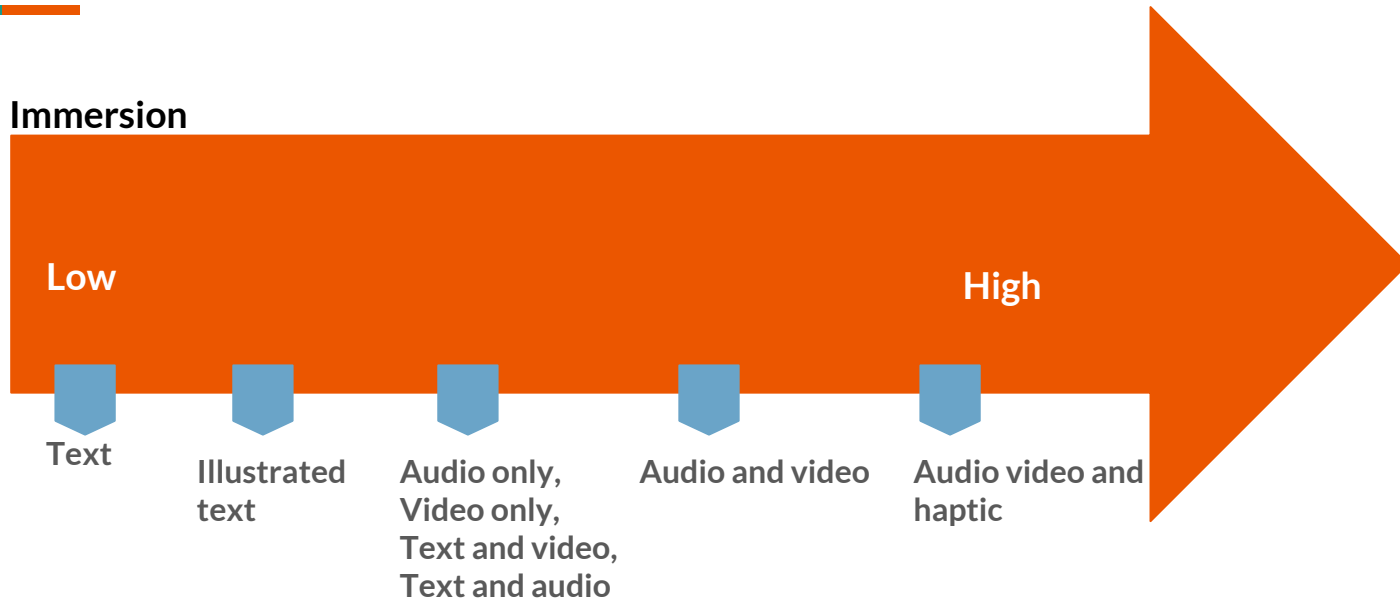
Humans rely on some senses more than on others.

Most VE focus mainly on visual aspects.

Simulator sickness.



## Immersion



# Uncanny Valley



<https://www.strangerdimensions.com/2013/11/25/10-creepy-examples-uncanny-valley/>  
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## Mori's poll

Masahiro Mori's original conception of the uncanny valley



Source: *Bukimi no Tani* (The Uncanny Valley) by Masahiro Mori, *Energy*, 1970



## **Interaction and interaction loop**

Second most important characteristic of VE: some method of interaction with the user.

The user is able to dictate the direction or at least the start/end of the movement.



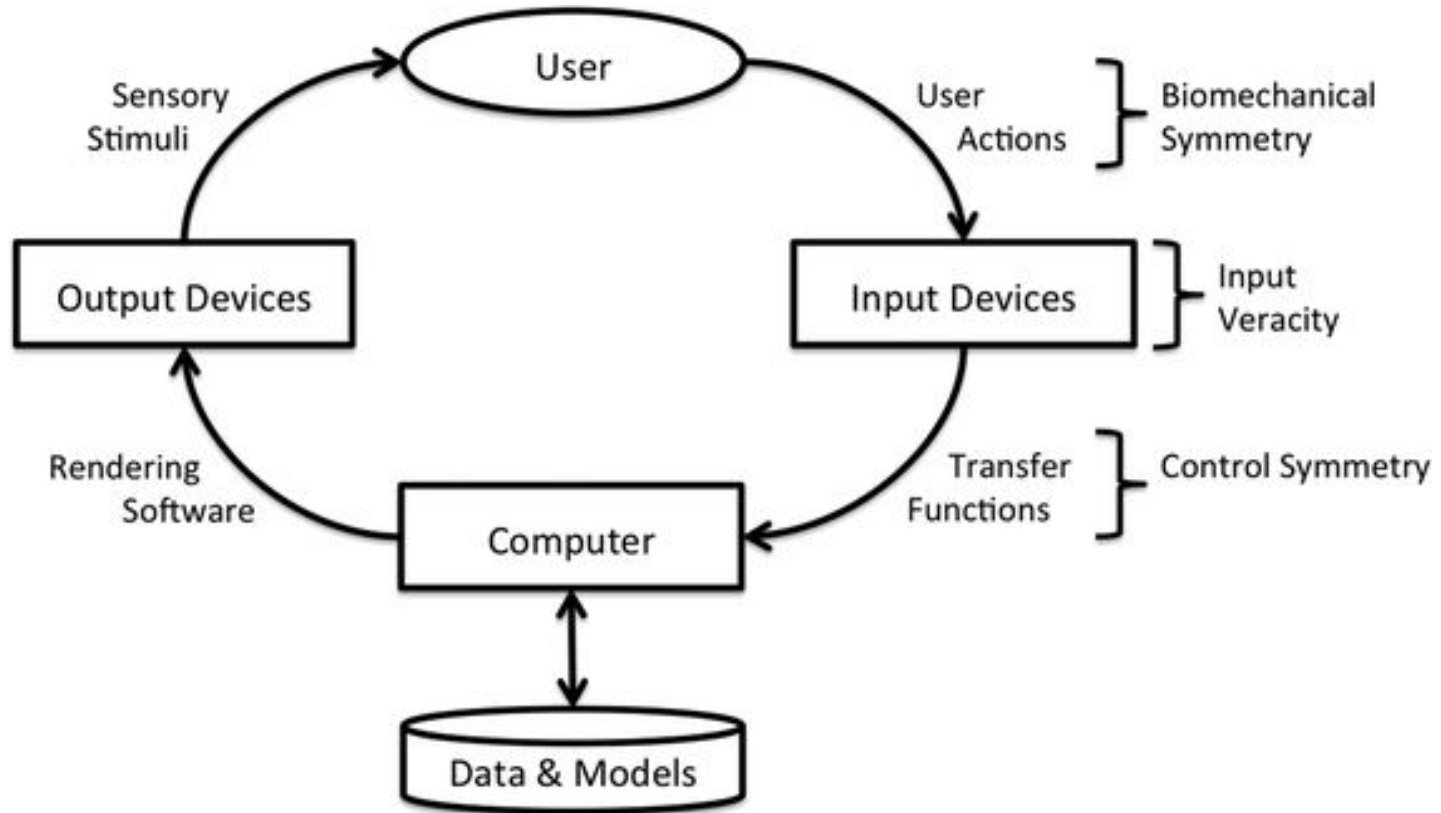


## **Interaction and interaction loop**

The interaction provided by a VR system needs to be real-time.

A user's interaction with the VE has the form of a constant feedback loop.

Interaction vs. immersion.





## Definition of Virtual Environments

Artificial spaces in some way separated from the physical world.

Perception based on computer-generated stimuli.

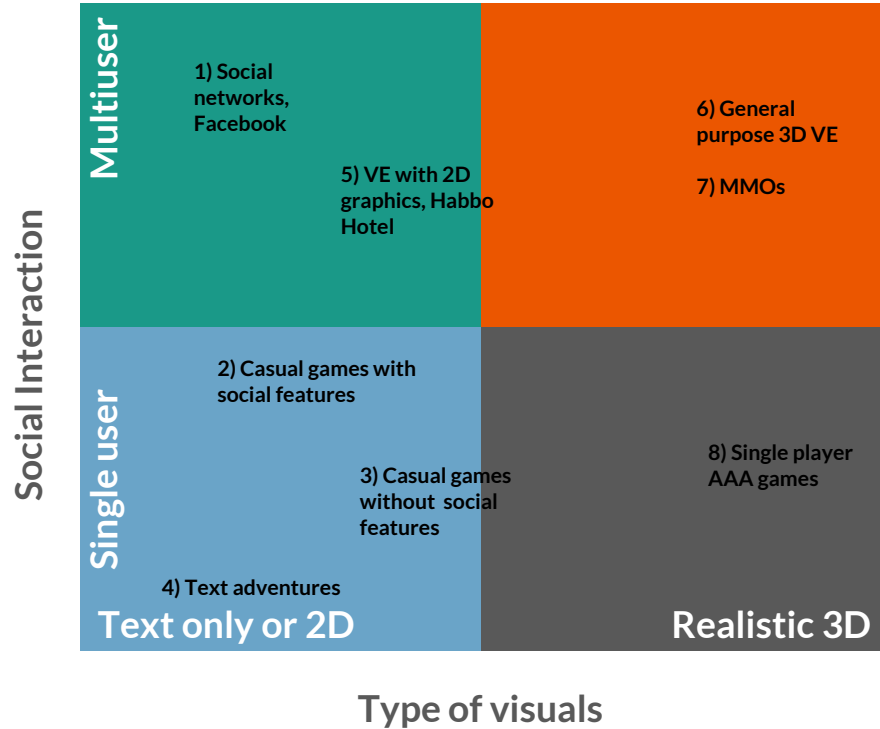
VE provide the sense of presence.

The property that sets VE apart from other similar media is **interaction**.

# Types of VE

Two criteria:

- interaction between users
- visual presentation





## Referências

G. Burdea, P. Coffet, *Virtual Reality Technology*, Second Edition, Wiley-IEEE Press, June 2003.

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D. Johnson, “Introduction to and Review of Simulator Sickness Research”, Research Report 1832, U.S. Army Research Institute for the Behavioral and Social Sciences, Retrieved 14, April 2014.

M. Mori, “The uncanny valley”, *IEEE Robotics & Automation Magazine*, Vol. 19, No. 2, 1970, pp. 98-100.