



UNIVERSITÀ DEGLI STUDI DI MILANO  
DIPARTIMENTO DI INFORMATICA

# OGD Lesson 001: A bit of background: games & fun

Laura Anna Ripamonti – ay 2021-22



# 001. Summary

- What is a game?
- What is “fun”?
- Common errors (boredom)
- What a game teaches ...
- References:
  - Chapters 1-5 of **A Theory of fun for game design** R. Koster
  - Chapters 1-2 of **The art of Game Design** J. Schell



# A warning ... games must be taken seriously ...

- (video)games (all!) are tricky to study & define, because they are so **multidimensional**, they involve:

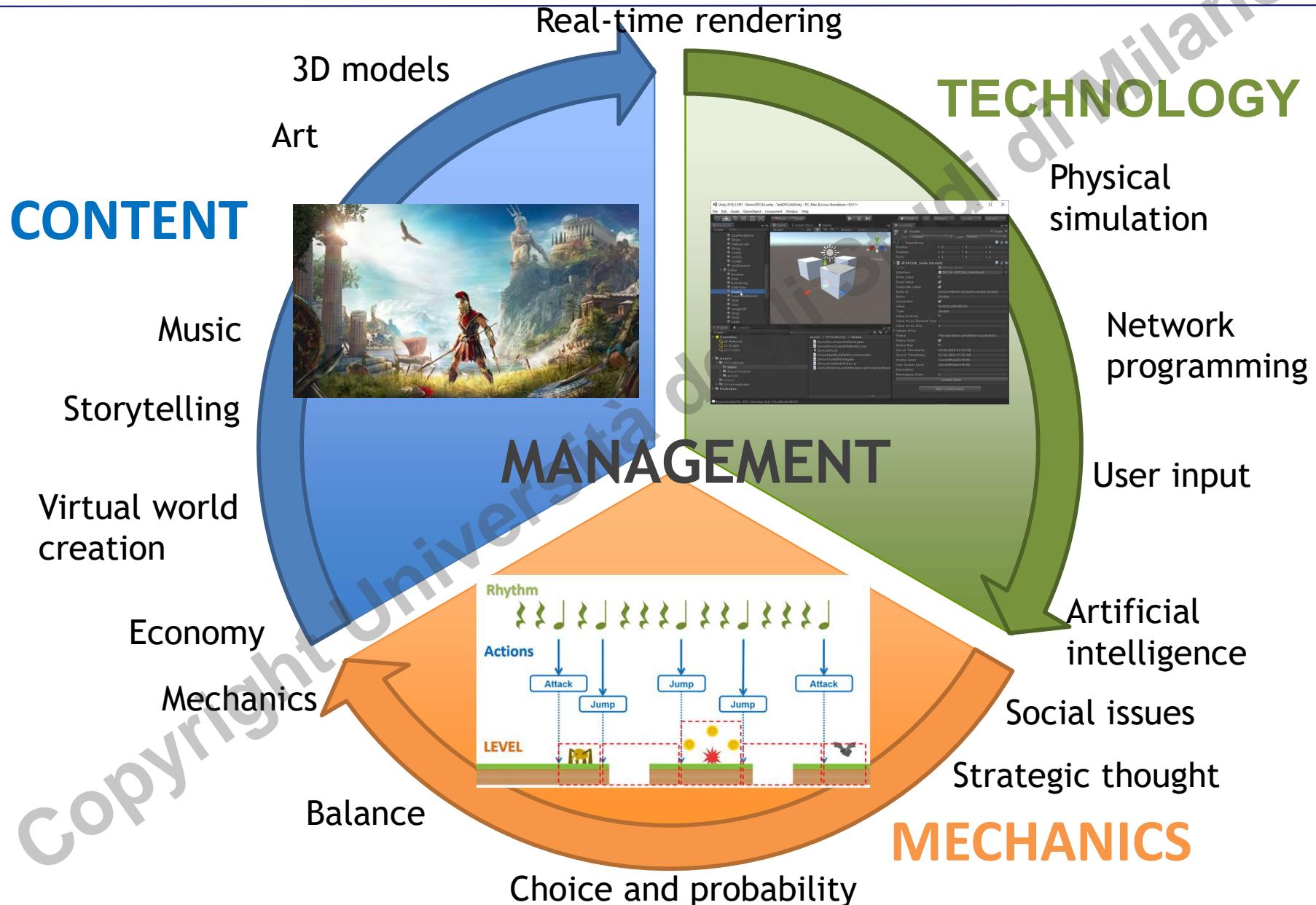
- Computer science
- Mathematics
- Physics
- Design
- Cognitive psychology
- Environmental design
- Storytelling
- Economy
- Visual art
- Music
- Etc.



# Games are art AND science



# What you need to create a video game ...



# Games are like lasagna ... ;-)

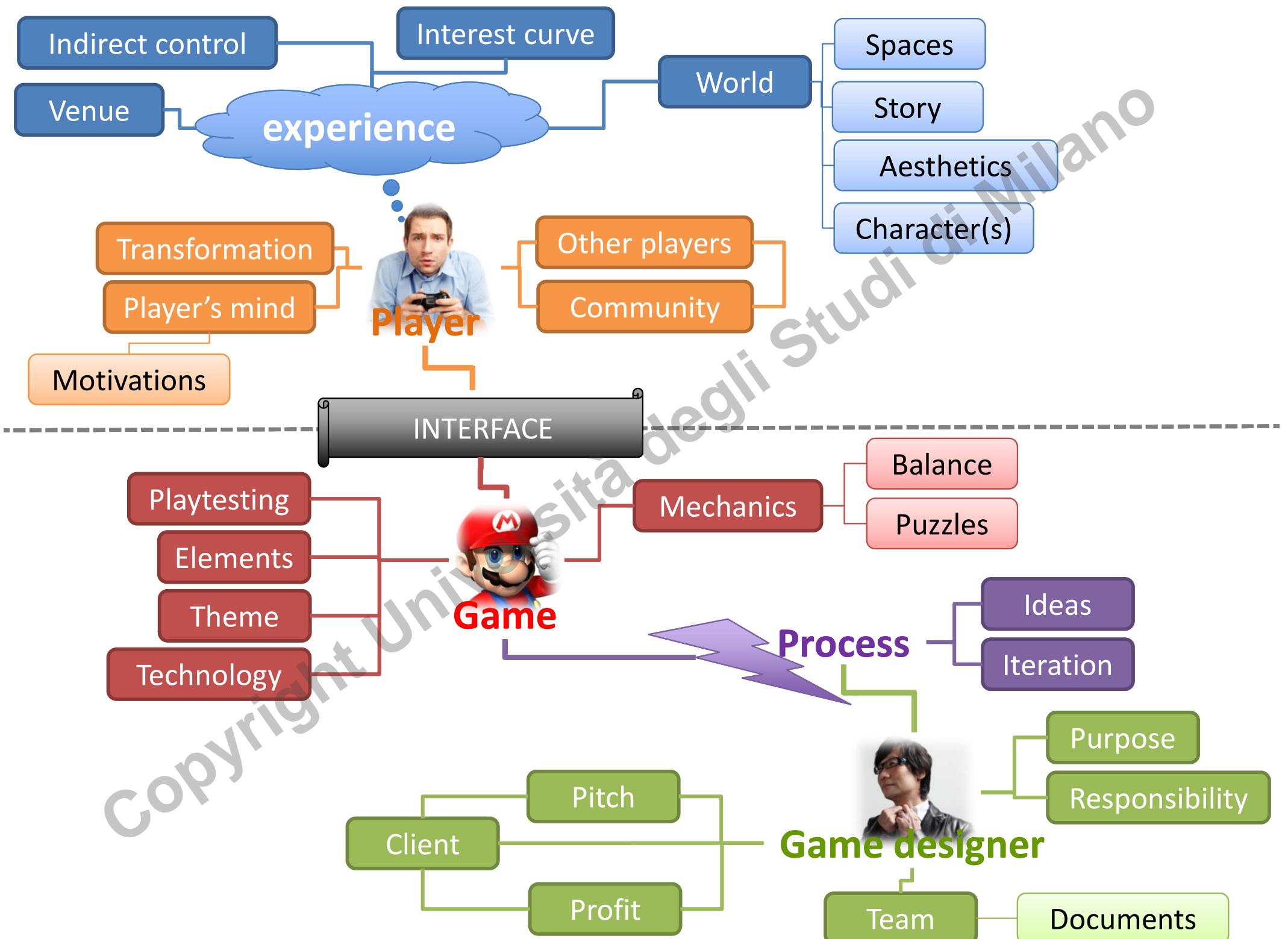
- It's the ingredients **mix** that generates the flavour ...

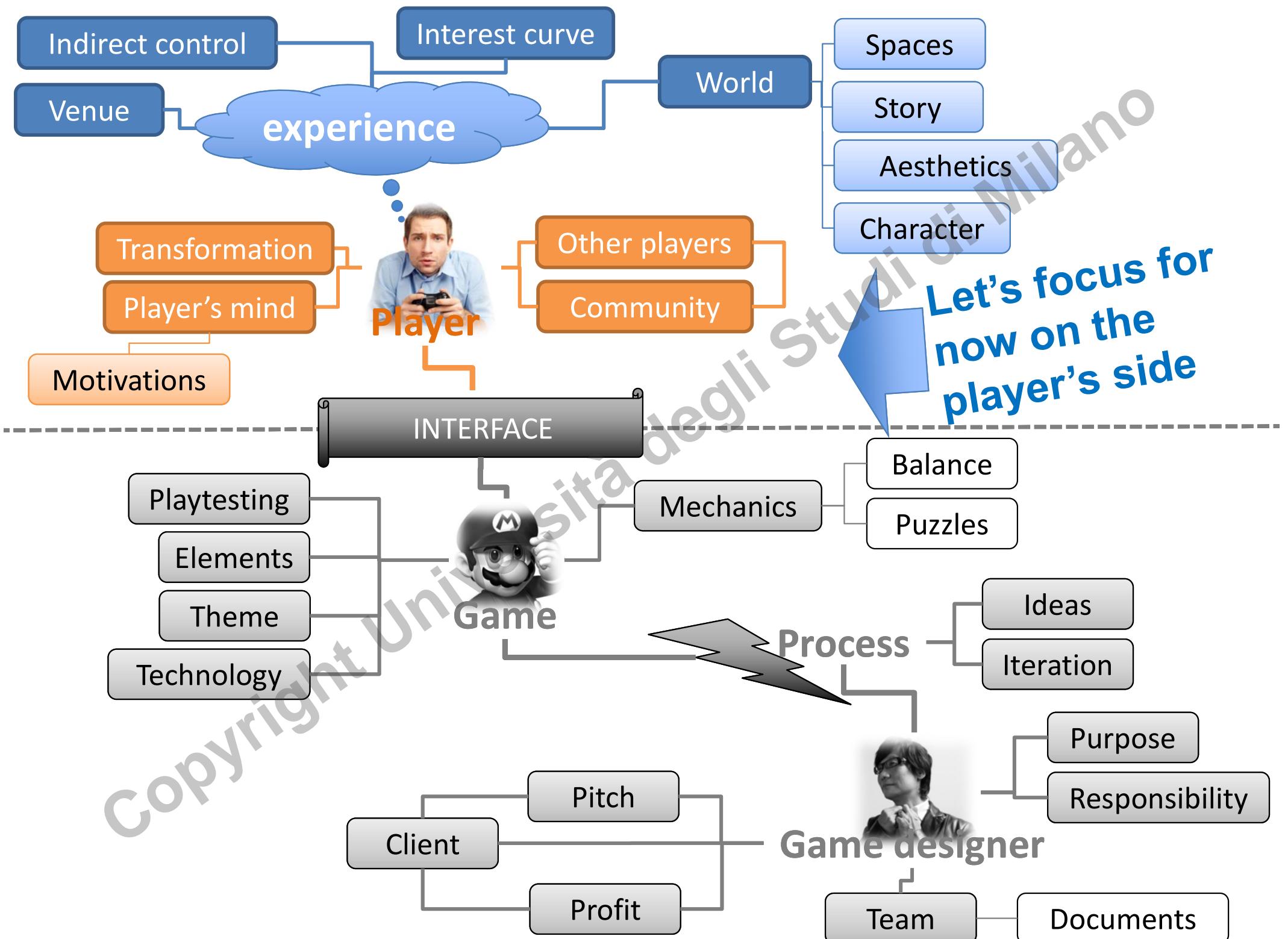


# And the Game Designer cooks lasagna ...



- The GD is like a cook: she picks the ingredients and prepares the meal:
  - Each ingredient alone is not necessarily delicious...
  - The result depends on how they are mixed together: it could be delicious, so-so, or terrible ...





# Games ARE experiences ... !!!

GD = game designer

- Games are worthless unless people play them
- A GD does not care about games ... they are a mean to an end: «**make people happy**»
- When people play games, they have an experience (btw: it's different for each of them!)
- The GD cares about this EXPERIENCE  
=> to what seems to exist .. !!

**THE GAME IS NOT THE  
EXPERIENCE, IT ENABLES  
THE EXPERIENCE!**



# Knowledge useful for game design ..

- **Animation:** understanding powers and limits of character animation opens the door for clever game ideas
- **Anthropology:** study your audience in their habitat
- **Architecture:** GD creates whole cities and worlds, not only buildings
  
- **Brainstorming:** create ideas by the hundreds
- **Business:** game industry is ... an industry!
  
- **Cinematography:** many games have movies in them, understanding this art as a way to deliver emotions
- **Communication:** coordination of multidisciplinary teams
- **Creative writing:** to create entire fictional worlds and populations



# Knowledge useful for game design ..



- **Economics**: many games feature complex economies
- **Engineering (& Computer Science)**: exploit the power and recognise the limits of each new technology



- **Games**: ... familiarity with ALL games genres ... ;-)



- **History**: many games are placed in historical settings



- **Management**: games are developed in teams ...
- **Maths**: games are full of maths, probability, risk analysis, scoring systems, etc.
- **Music**: needed for immersivity

# Knowledge useful for game design ..



- **Psychology**: the goal is making a human being happy
- **Public speaking**: to present ideas to teams or other people (e.g. investors, publishers, producers, etc.)



- **Sound design**: «hearing is believing»



- **Technical writing**: to produce development documents

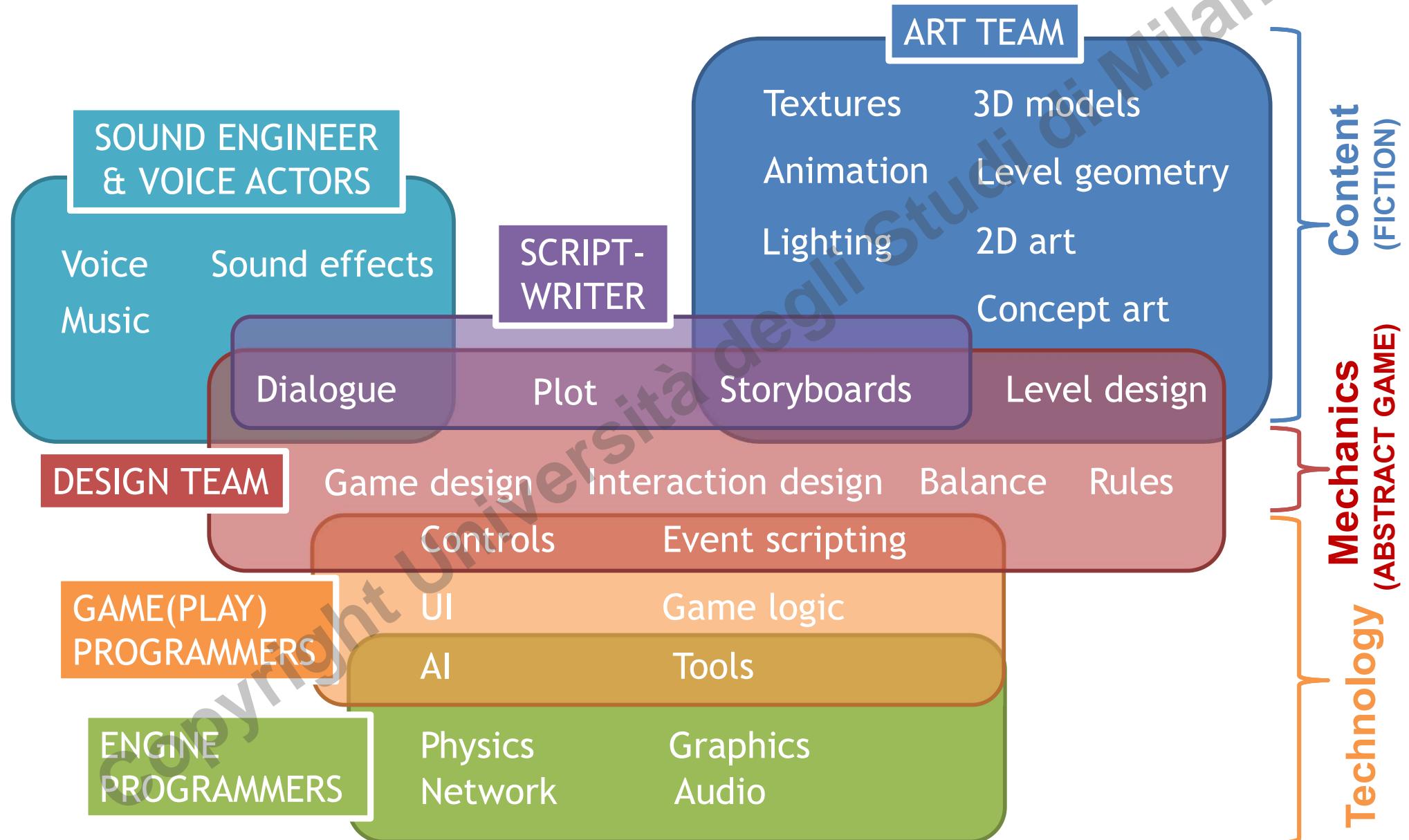


- **Visual arts**: games are full of graphics

... but the MOST IMPORTANT skill is **LISTENING**



# Teams & functions in a (big) game project ...



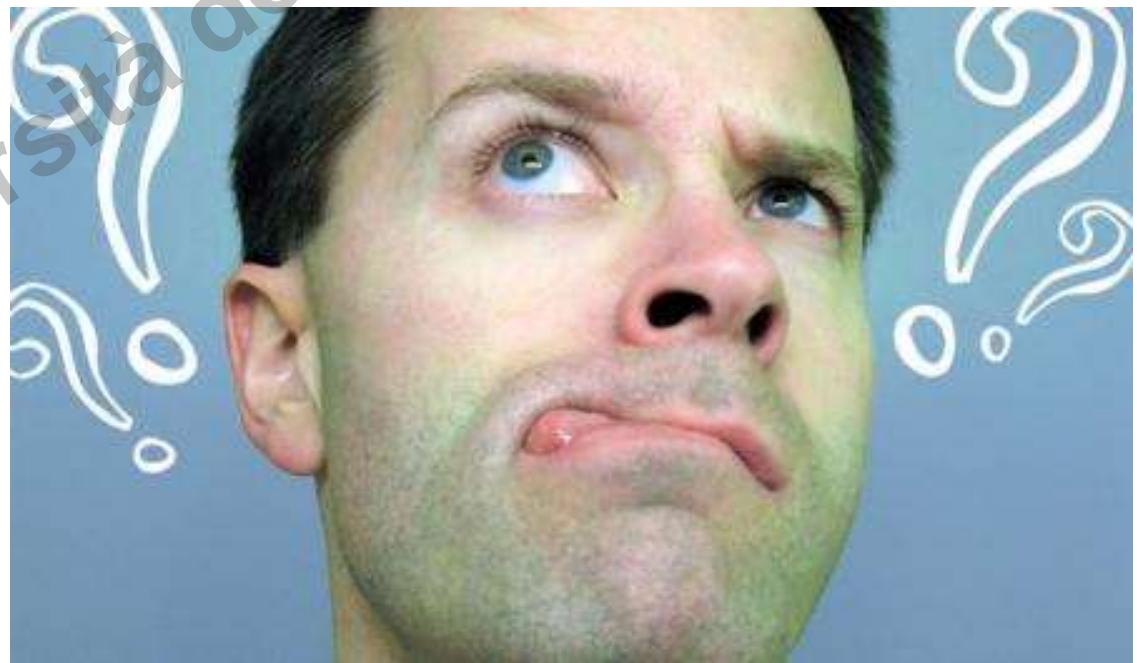
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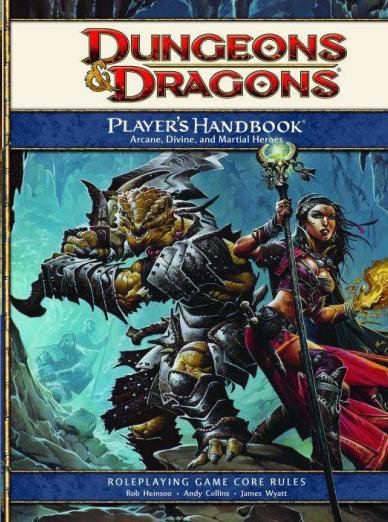
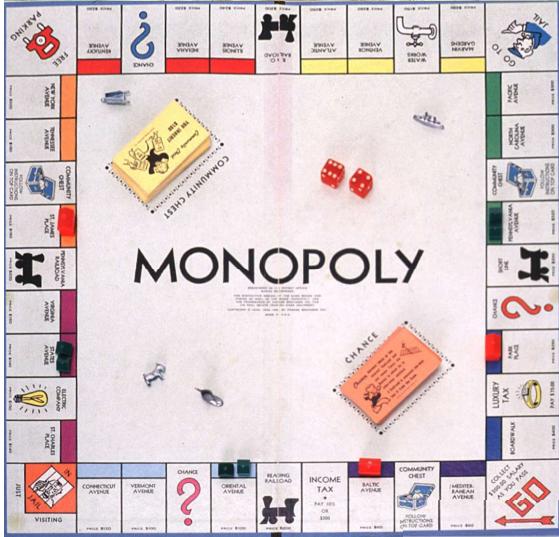
What games are ...



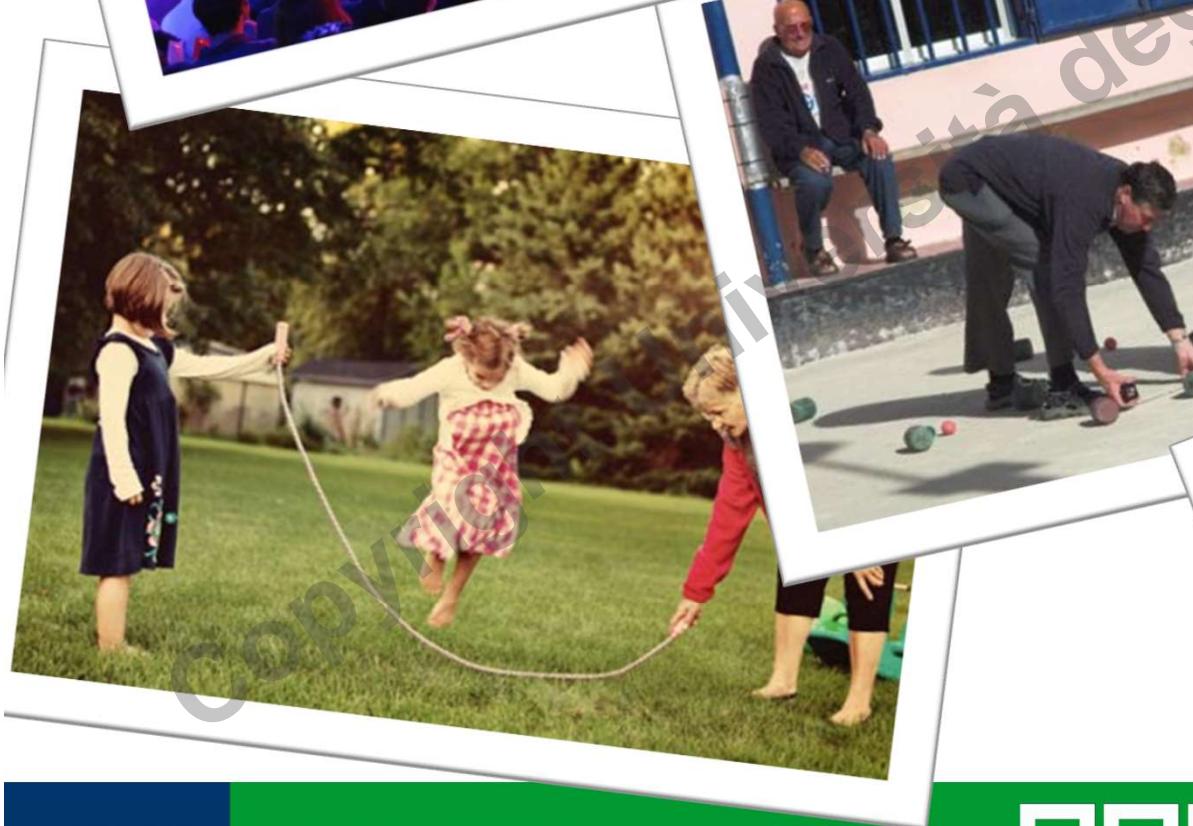
... but ... wait a  
minute...

WHAT IS  
A «**GAME**»  
???????





Risiko!



# WHAT IS A «*GAME*» ??????

You'd like to create games ...  
so u'll surely know ...  
try to explain it to him ...



# What is a game? Several definitions ...

- Activity which is voluntary, uncertain, unproductive, governed by rules, makebelieve (Robert Caillois)
- Free activity, outside “ordinary” life (Johan Huizinga)
- A game is a rule-based formal system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome, and the consequence of the activity are optional and negotiable (Jesper Juul)
- Games are a subset of entertainment limited to conflicts in which players work to foil each other’s goals, just one of many leaves off a tree that includes playthings, toys, challenges, stories, competitions, etc. (Cris Crawford)
- One or more causally linked series of challenges in a simulated environment (Ernest Adams & Andrew Rollings)
- A series of meaningful choices (Cid Meier)
- A game is a system in which players engage in an artificial conflict, defind by rules, that results in a quantifiable outcome (Katie Salen & Eric Zimmerman)



... and .. FUN ??



# What is a game?

- A child loves her play, NOT because it's easy, but because it's HARD
- For a small child there is no division between playing and learning

... but she has ... FUN!



Why are some games fun and other games boring? Why do some games start getting boring after a while, and other games stay fun for a long time?



Understanding what “**HAVING FUN**” means, it’s crucial for designing good games!

# Raph Koster ...



Former Chief creative officer @

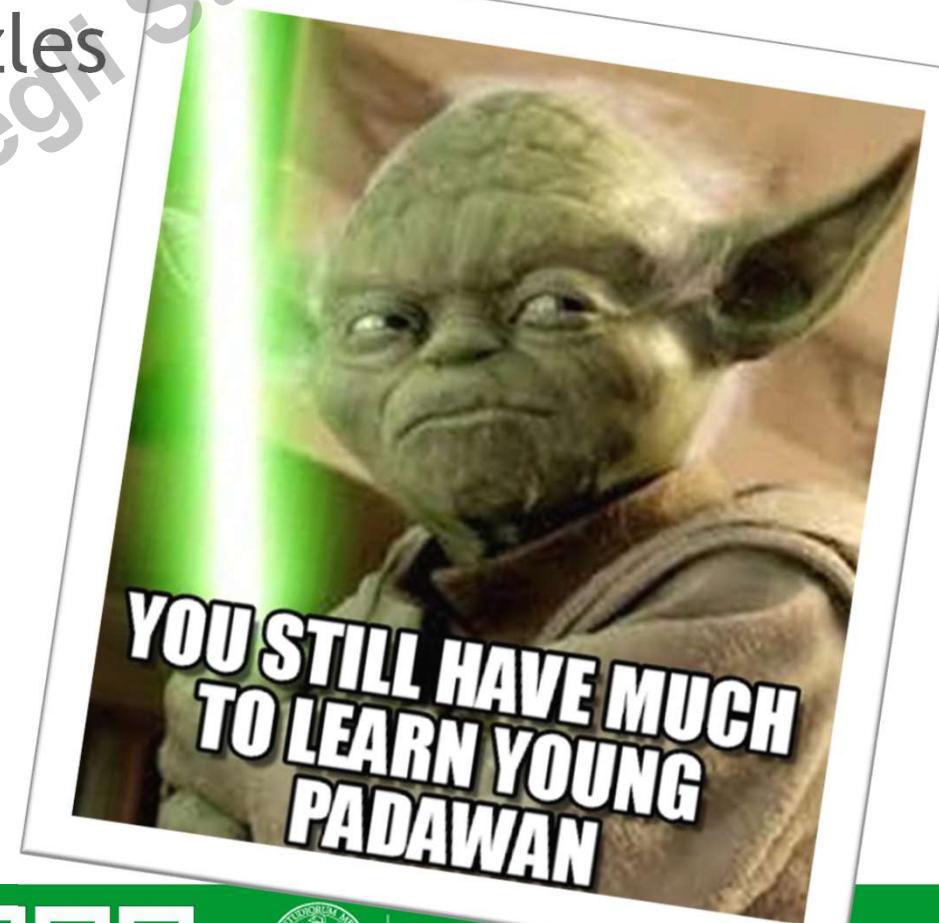


**SONY ONLINE  
ENTERTAINMENT**

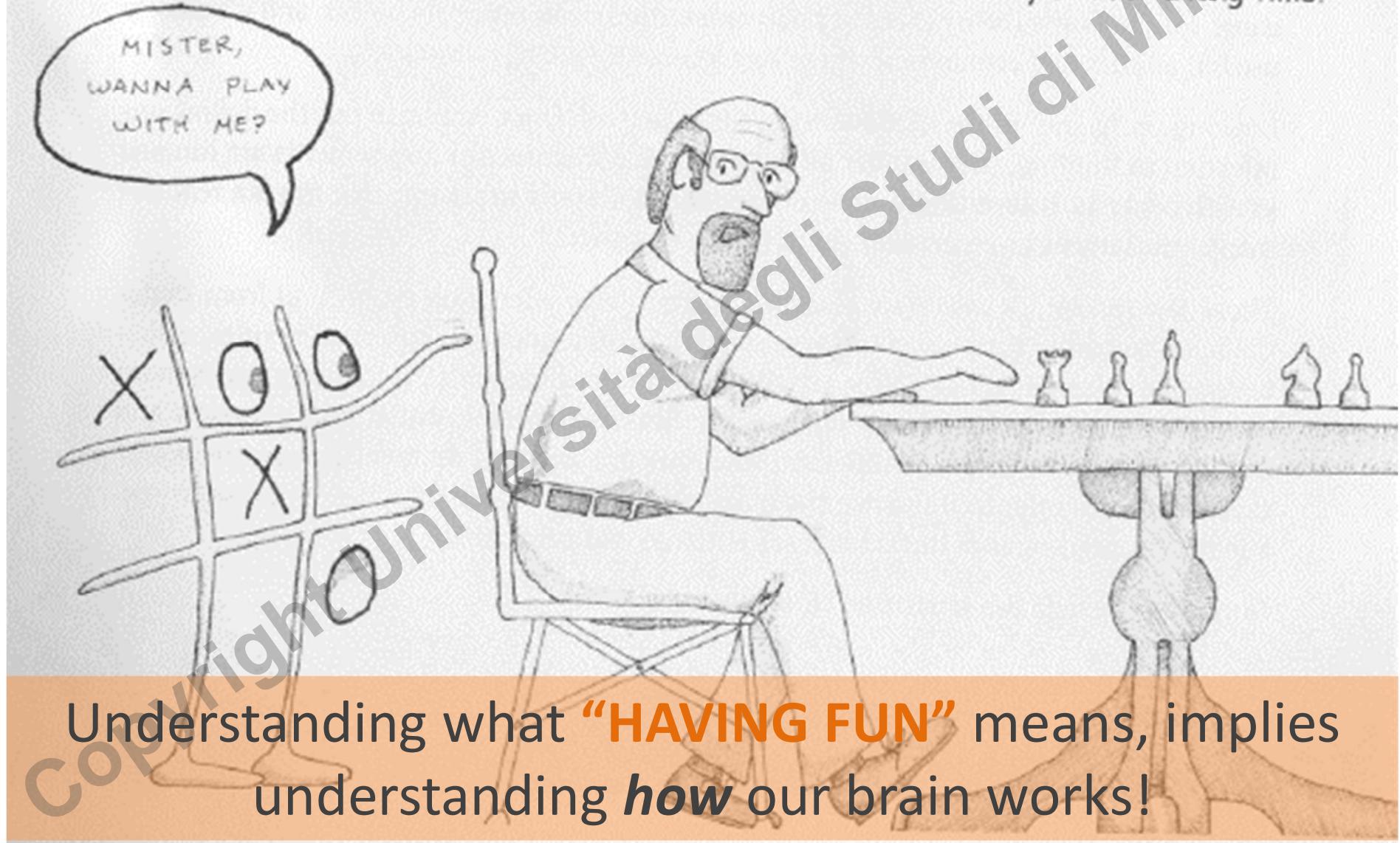
# Why is a game fun?

- Fun in games arises out of mastery.
- It arises out of comprehension.
- It is the act of solving puzzles that makes games fun.

With games, learning  
is the drug ...

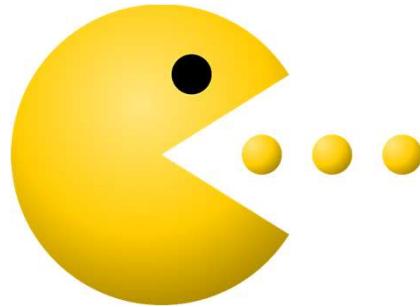


Why are some games fun and other games boring? Why do some games start getting boring after a while, and other games stay fun for a long time?



Understanding what “**HAVING FUN**” means, implies understanding **how** our brain works!

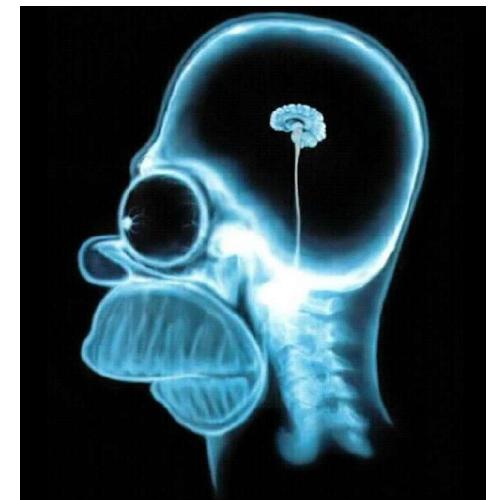
# Why is a game fun?



Our brain is a voracious consumer of PATTERNS



- Children learn **by errors & trials** (e.g. watch the same movie over and over and over and ...) and not by being taught
- They try to figure out PATTERNS!  
That's how our brain learns



# Patterns: faces & expressions



When we grasp a pattern, we usually get bored with it and iconify it



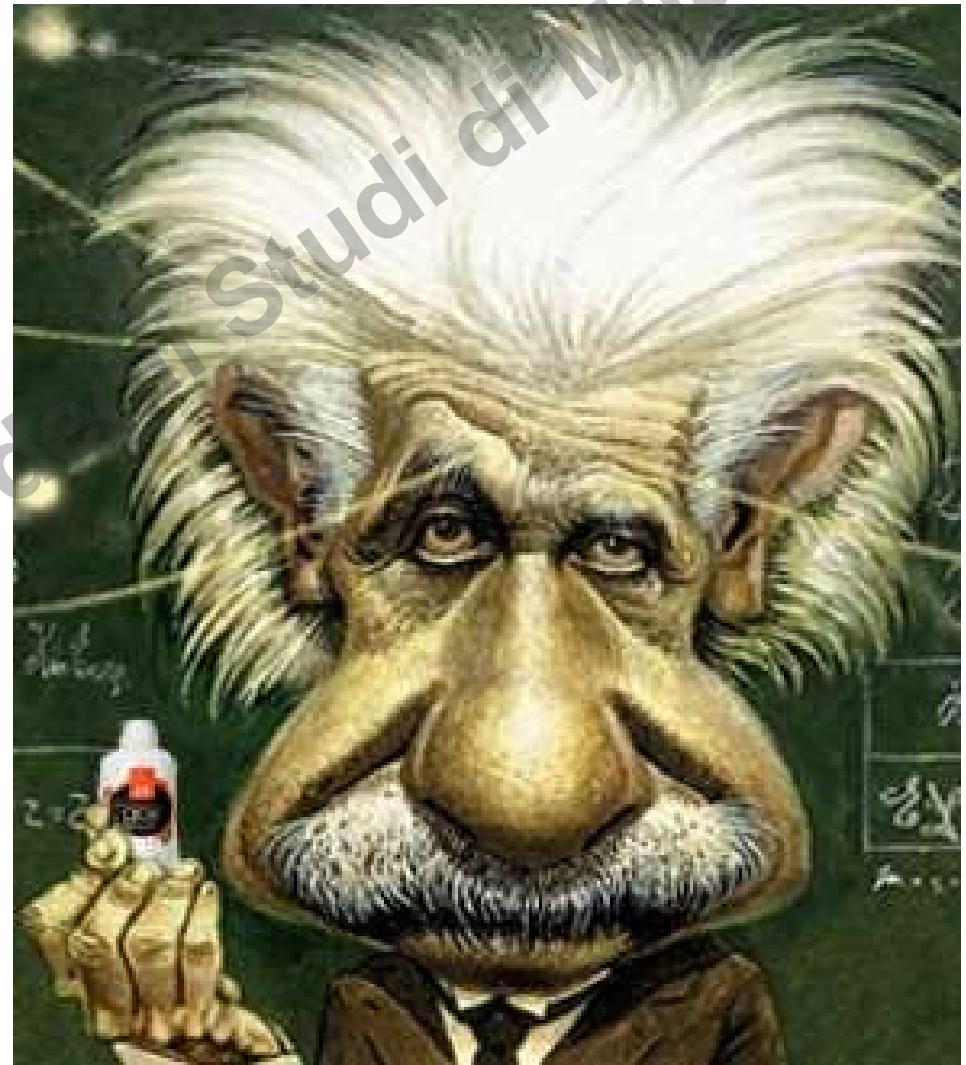
# In other words ... our brain

- ... is made to **fill in blanks**:
  - We are not really “conscious”, we do many things on autopilot!
- ... is good at **making assumptions**:
  - Es. you do not notice your nose
- ... is good at **cutting out the irrelevant**:
  - Es.: count the girls and u'll miss the pink gorilla
- ... **notices a lot more** than we think:
  - Es.: description under hypnoses are more accurate
- ... **actively hides the real world** from us:
  - Es.: we usually draw the iconified version of an object, not the actual one



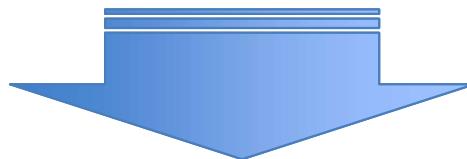
# In other words ... our brain

- Has its **limits**:
  - It's able to maintain a limited number (around 7) units of information in its short-term memory
- But **tries to overcome them**:
  - Each information unit can be fairly complex provided that it has been «chunked» (i.e. reduced to a «schemata», «algorithmic representation of reality»)



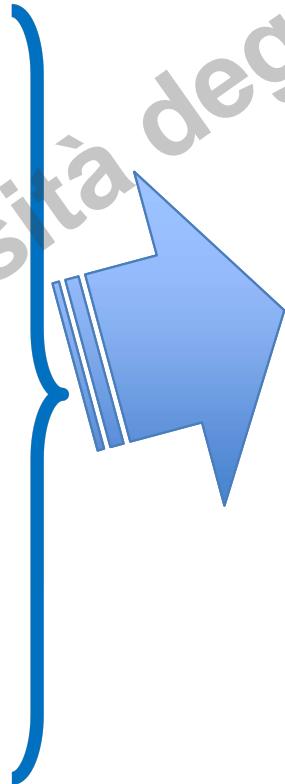
# To summarize:

**Our brain is a (voracious) consumer  
of PATTERNS**



- Our brain:

- Makes assumptions  
(fills in the blanks..)
- Cuts out the  
irrelevant
- Notices more than  
we think
- Hides real world  
from us

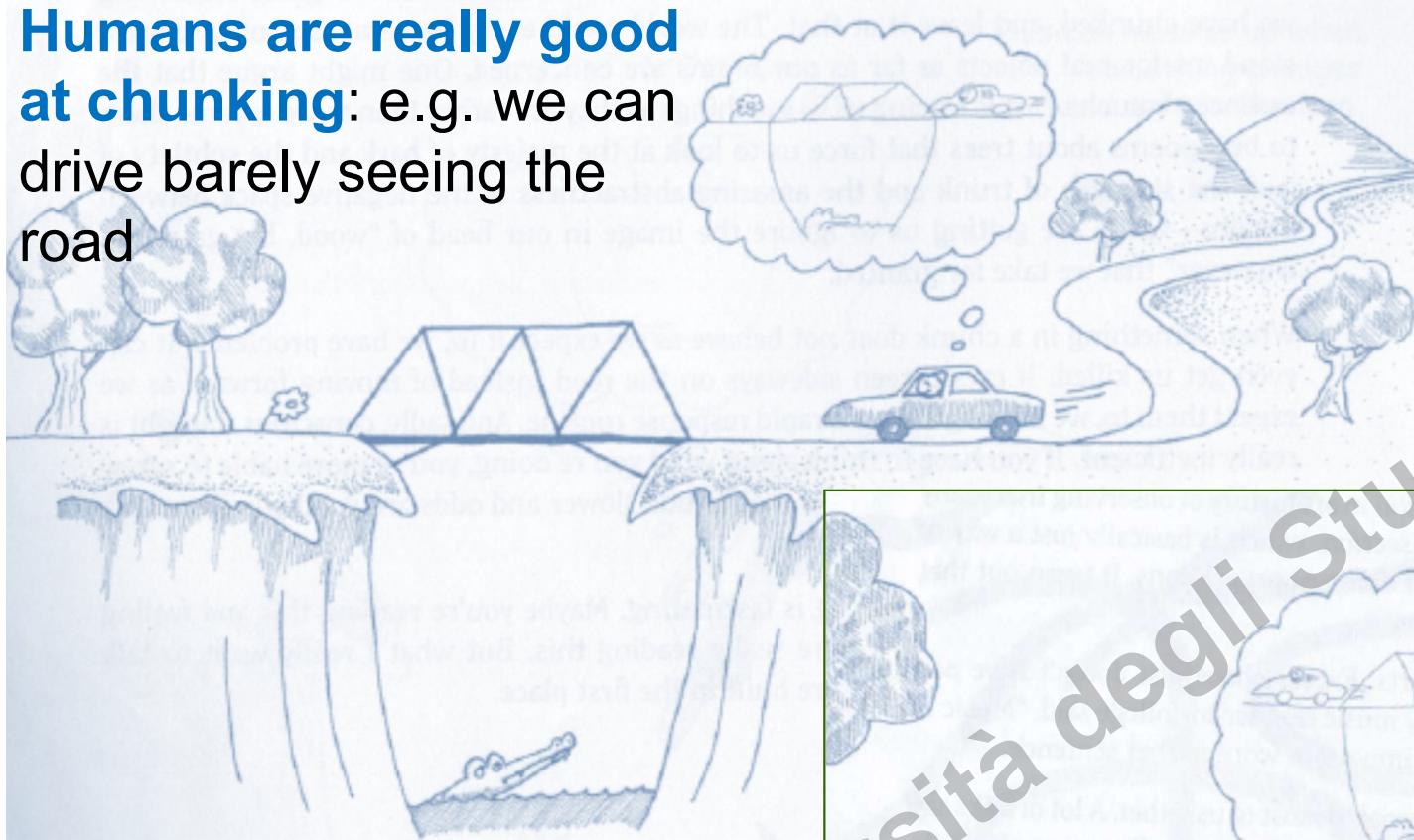


**“CHUNKING”:**  
routines are “burned”  
into neurons

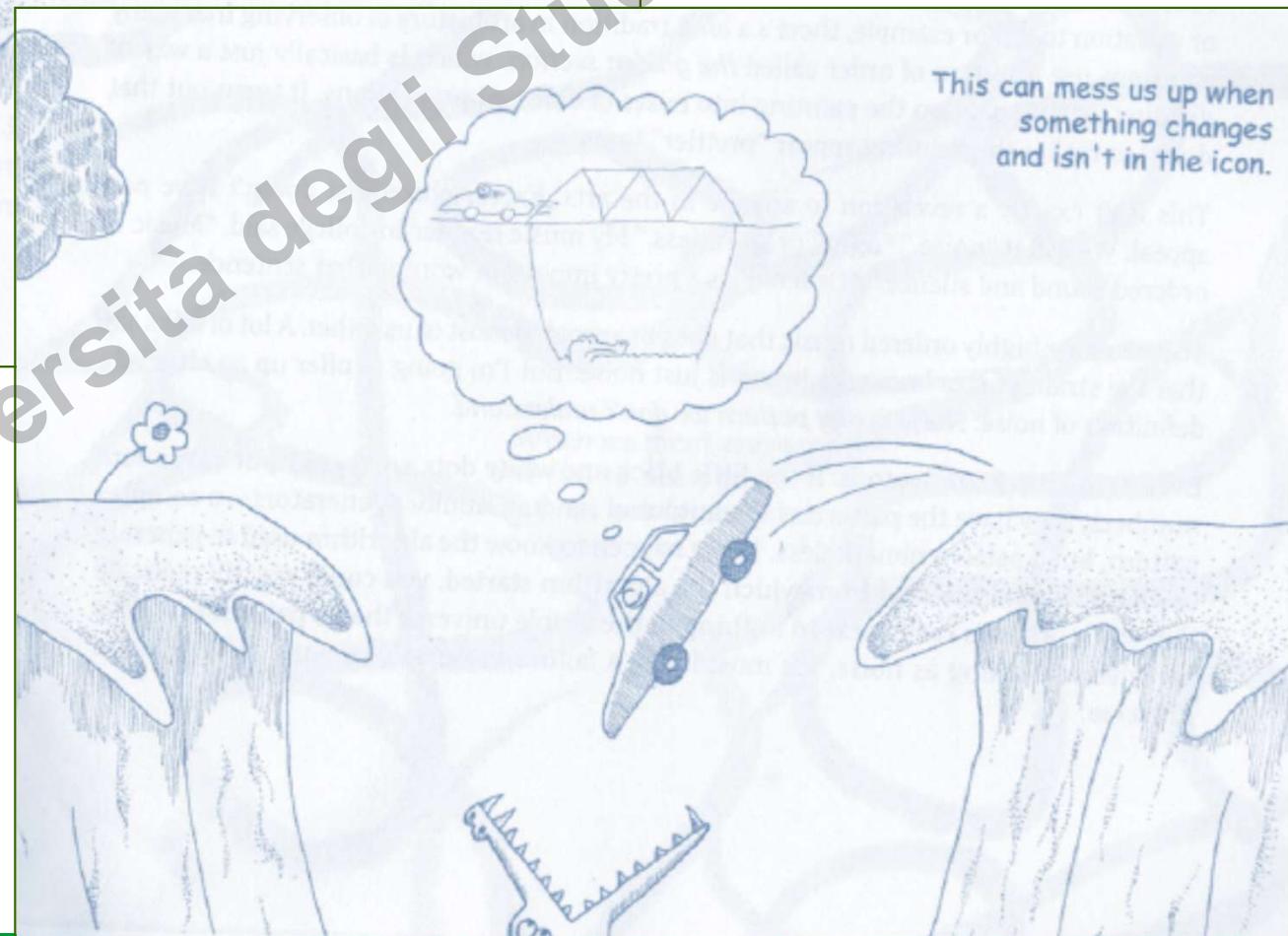
“Chunks” are schemata =  
macrostates, algorithmic  
representation of reality  
(... while conscious thought is  
really, REALLY inefficient!)



**Humans are really good at chunking:** e.g. we can drive barely seeing the road

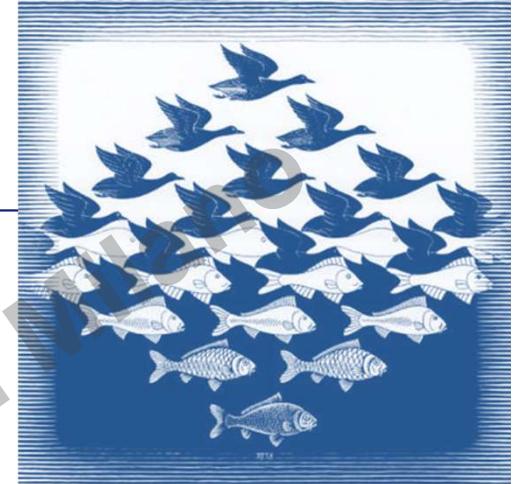
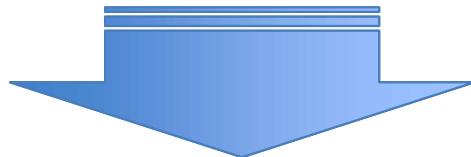


We rarely look at the real world, we instead recognize something we have chunked and leave it at that



# Why is a game fun?

## Games are iconic depiction of PATTERNS



- They are more related to the way our brain works, than to the actual world. Our brain:
  - Learns the underlying pattern
  - “Groks” it fully
  - Files it away (and reruns if needed)
- Games are **iconified representation of human experience** that we can (safely!) PRACTICE with and learn patterns from. But they are also **LIMITED FORMAL SYSTEMS => boredom is inevitable**



# Why is a game fun?

That is to say:



Fun from games = **LEARNING**

**It's the act of solving puzzles that makes  
games ... fun !!**

(and our brain releases endorphins/dopamines)

**“Fun is the emotional response to learning”**

(C. Crawford, 2004)

PS all this, incidentally, means that Deathrace and Packman are ... quite the same ...

How games change us?



**IF PEOPLE WERE INFLUENCED  
BY VIDEO GAMES,  
THEN THE MAJORITY OF  
FACEBOOK USERS  
WOULD BE FARMERS  
BY NOW.**



# How do games change us?

- Can games be **good** for you?
  - Emotional maintenance
  - Connecting
  - Exercise
  - Education (& applied games)
- Can games be **bad** for you?
  - Violence
  - Addiction



# The issue of violence

- Games (AND stories, AND movies, AND comics, AND ...) often feature violent themes ...
- ... because they are about **CONFLICT!**
  - A violent act is a simple & dramatic way to settle a conflict



# Focus group with average parents ...

## Mortal Kombat



## Virtua Fighter



- Violent! Absolutely NOT ok for kids

- Violent, but ok for kids!

**WHAT'S THE DIFFERENCE?**

# Focus group with average parents ...

## Mortal Kombat



- Violent! Absolutely NOT ok for kids

## Virtua Fighter



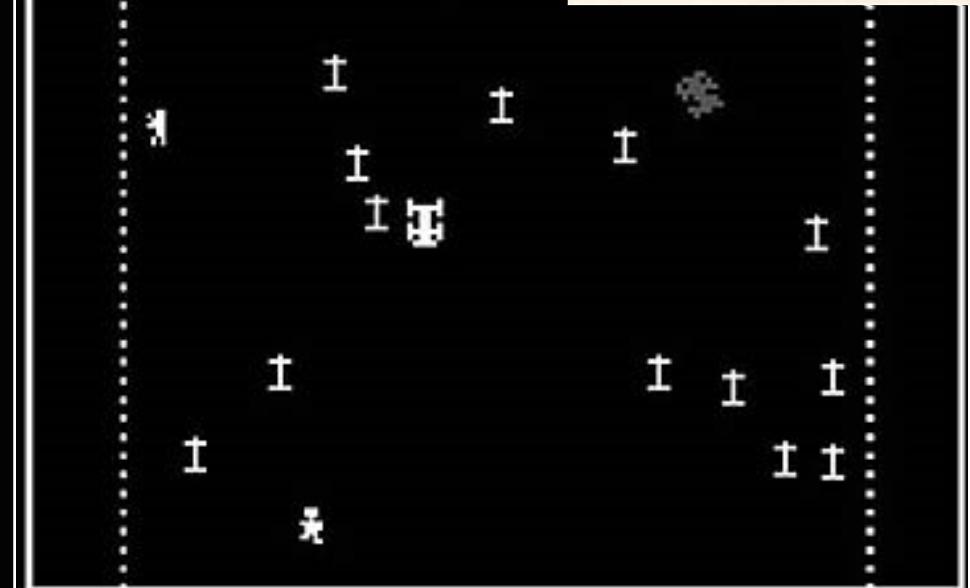
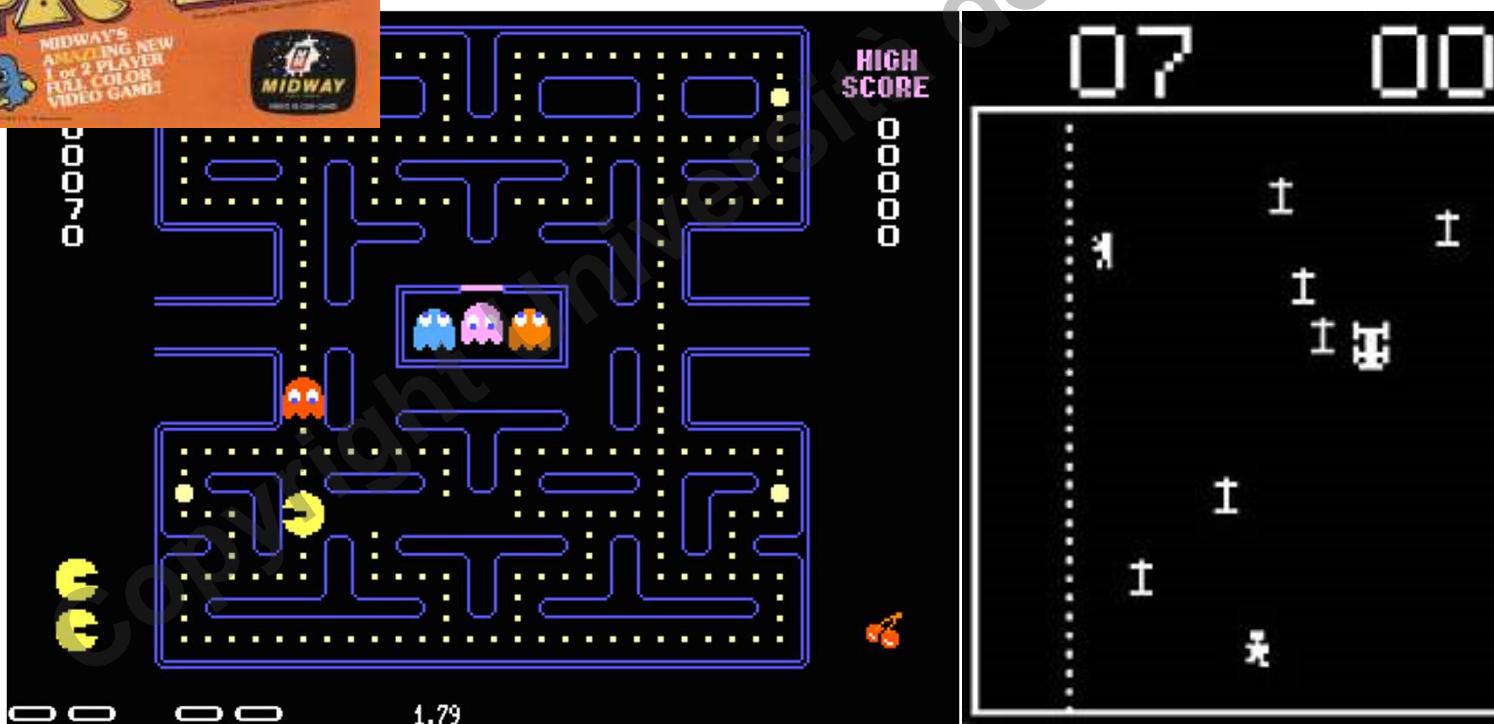
- Violent, but ok for kids!

**WHAT'S THE DIFFERENCE?**  
**THE PRESENCE OF BLOOD (AND REALISTIC GRAPHICS)**

# PacMan & Deathrace (2000)



Same pattern (survive while fleeing), but different metaphor:  
Pac-man was ok, Deathrace  
absolutely violente and  
unacceptable!



# Reasons for fearing violent video games

- Gamers become **desensitized to real-world violence and gore** (possible ... see what happens to doctors & nurses)
- Worries derives from the apparent **similarity between gamers and psychopaths** that kill for fun



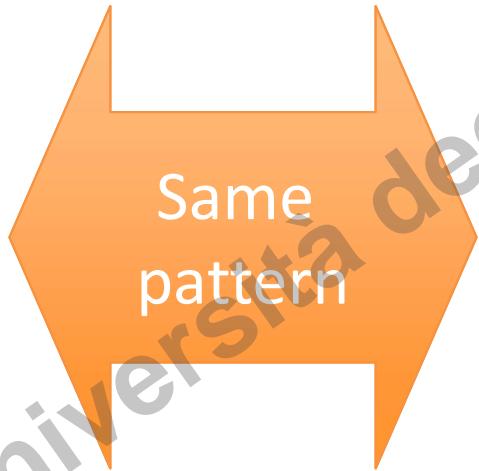
**BUT**

- The more you play a game, **the more you see through its metaphore**, and you are focused on
  - Pattern recognition
  - Problem solving
  - Solving puzzles
  - Accomplishing goals
- Average people (of any age) are **very good at distinguishing real and fantasy worlds** ...



# The issue of violence: hints to reflect upon

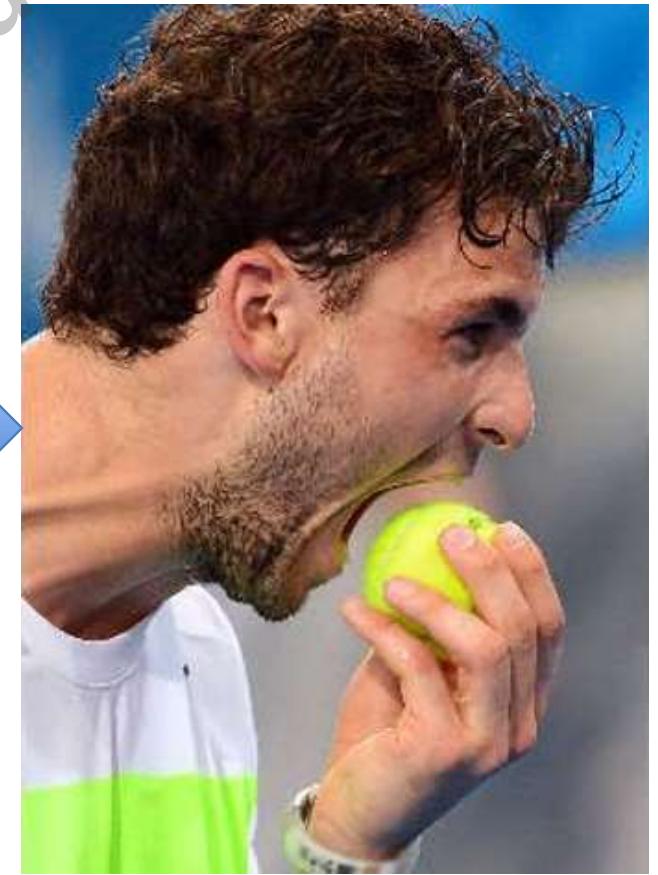
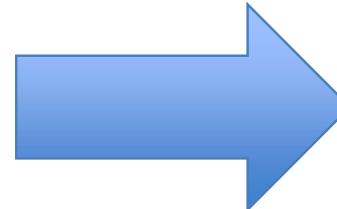
- For the reasons we've discussed so far, players are so dismissive of ethical implications of games ...



- They don't see "get a blowjob from a hooker, then kill her", but they see a power-up ...
- ... also... they would never eat a plastic ball in real life ...

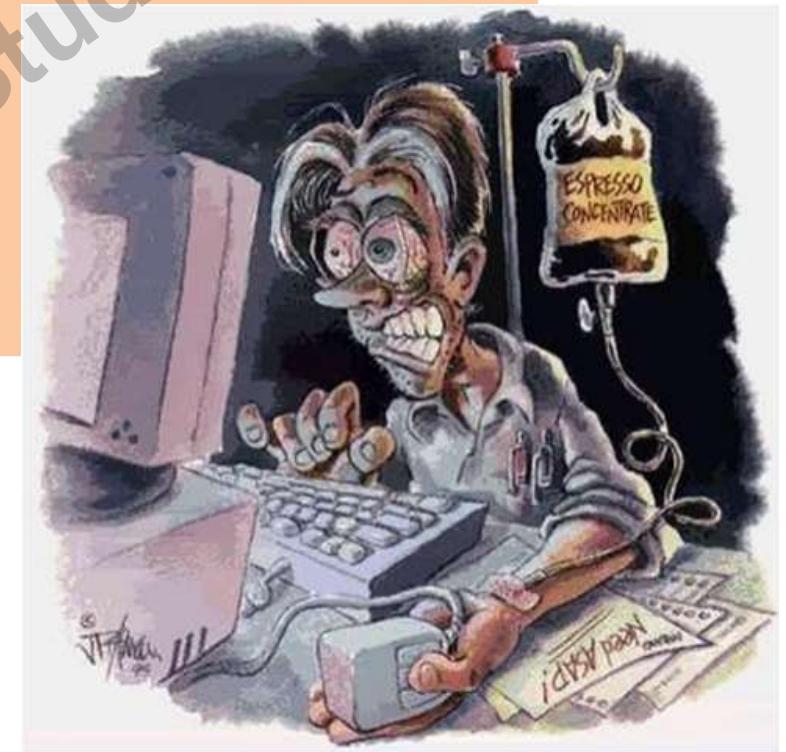
## As well as ...

- You do not eat tennis ball after playing Pacman  
... ;-)



# The issue of addiction

- Especially true for massive online game
- Self-destructive gameplay IS NOTHING NEW
  - Gambling
  - Bridge
  - D&D and RPGs (paper & pen)
  - Etc.
- Addiction to MMORPGs is complex, ‘cause different players have different motivations. They can be:
  - Pulled in by the game
  - Pushed in by real life (unsatisfactory)



# Avoiding addiction ... ?

- «design games not addictive» .....  
... is like asking a cook to “bake cakes not too delicious” .... ???
- Try to **design games that fit into a well-balanced life!**
- BTW: it’s your responsibility as GD!



Who's that guy? LEARN the history of video games & game designers!



“

*“On a sunny day, play outside.”*

*Shigeru Miyamoto*



# Nonetheless ... neuropsychologists says

- Since games implicitly teach systems ... we have an art form on our hands that actually **CHANGES BRAINS.**

Brain structure appears to predispose you towards game skills – and more, towards success in **SPECIFIC** skills

Expert gamers outperform novices across several measures of attention and perception



Subjects who played casual games for 30' periods showed an 87% improvement in cognitive response time and a 215% increase in executive functioning

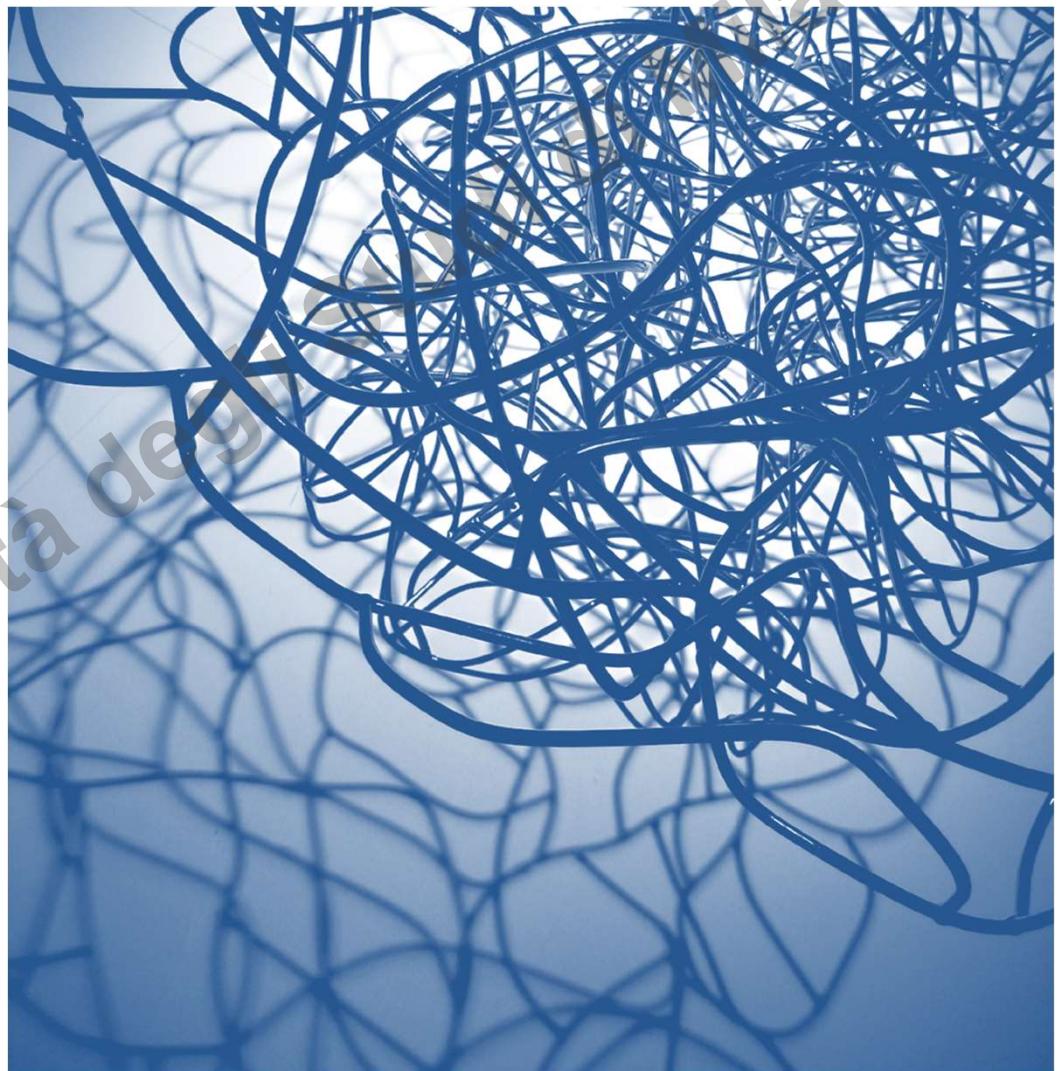
**So we had better use it responsibly !!**

What to avoid  
in games ...

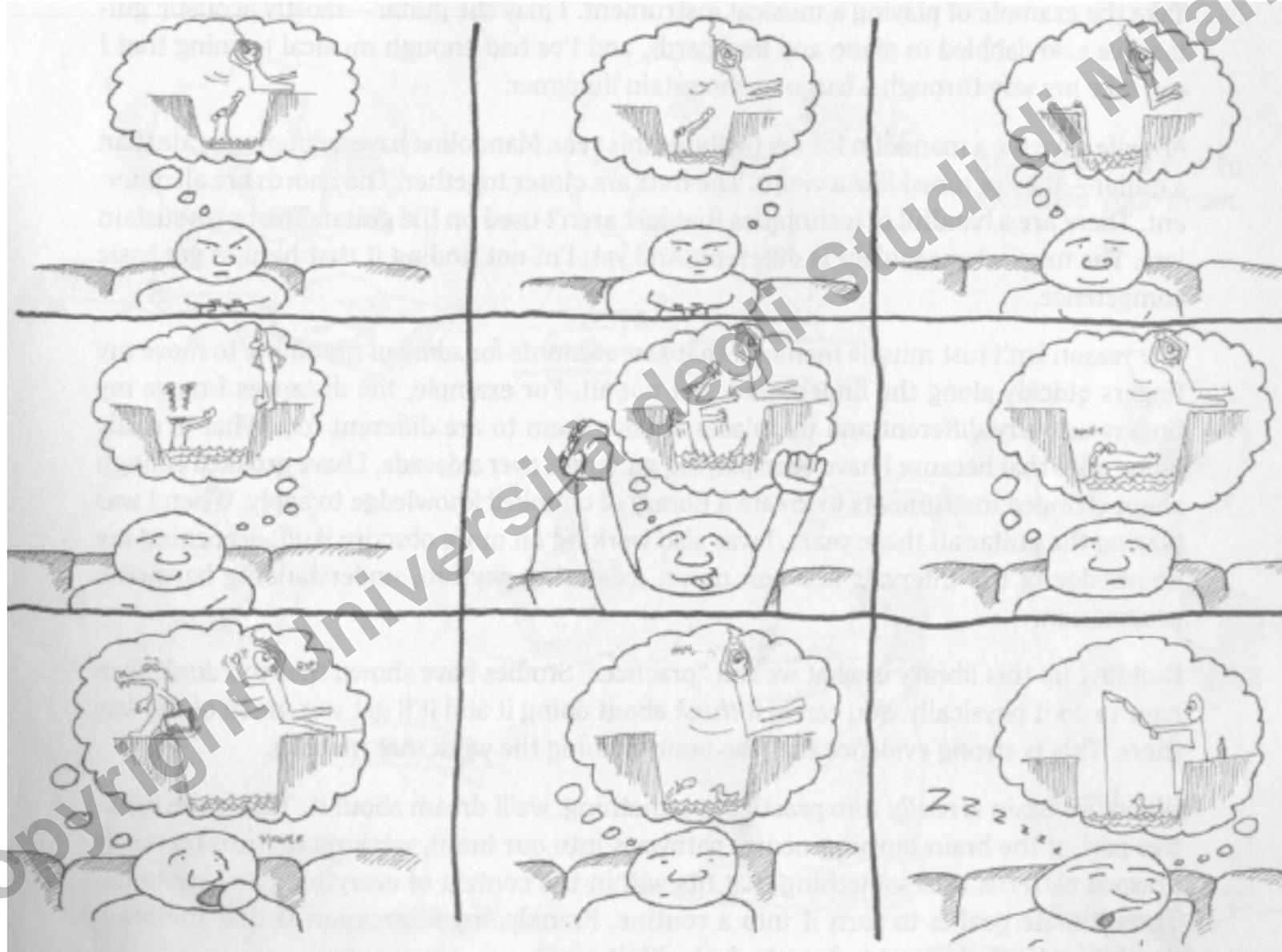


# What is a frustrating game?

- When we meet “NOISE” we fail to see a pattern in it
- We get frustrated and give up

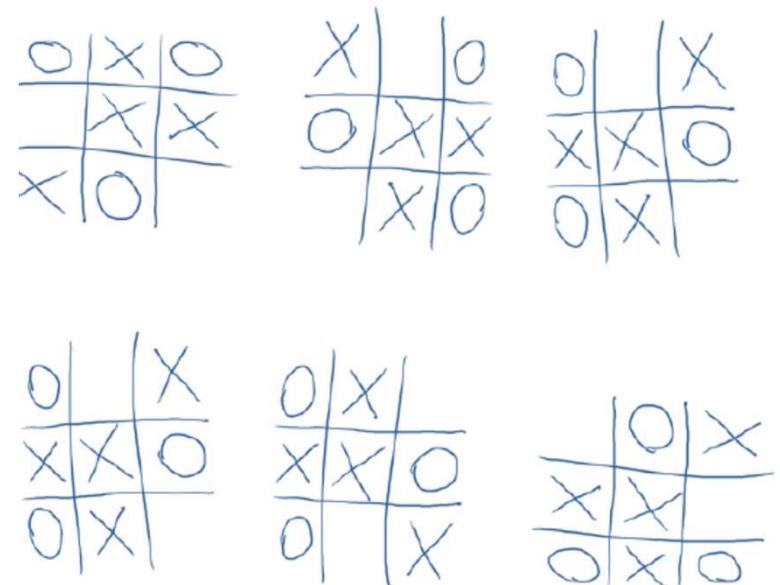


The more we practice ... the less we have to think  
about what we're doing ....



# What is a boring game?

- ... but once we see a **pattern** we delight in tracing it and in seeing it reoccur (this is “practicing”), since **it is FUN to exercise your brain**
- Games are puzzles (they are ‘bout cognition and learning to analyze patterns) ...
- ... when you are playing a game, u’ll only play it untill u master the pattern: once u’ve mastered it, the game becomes **BORING** ...



# Boredom & games

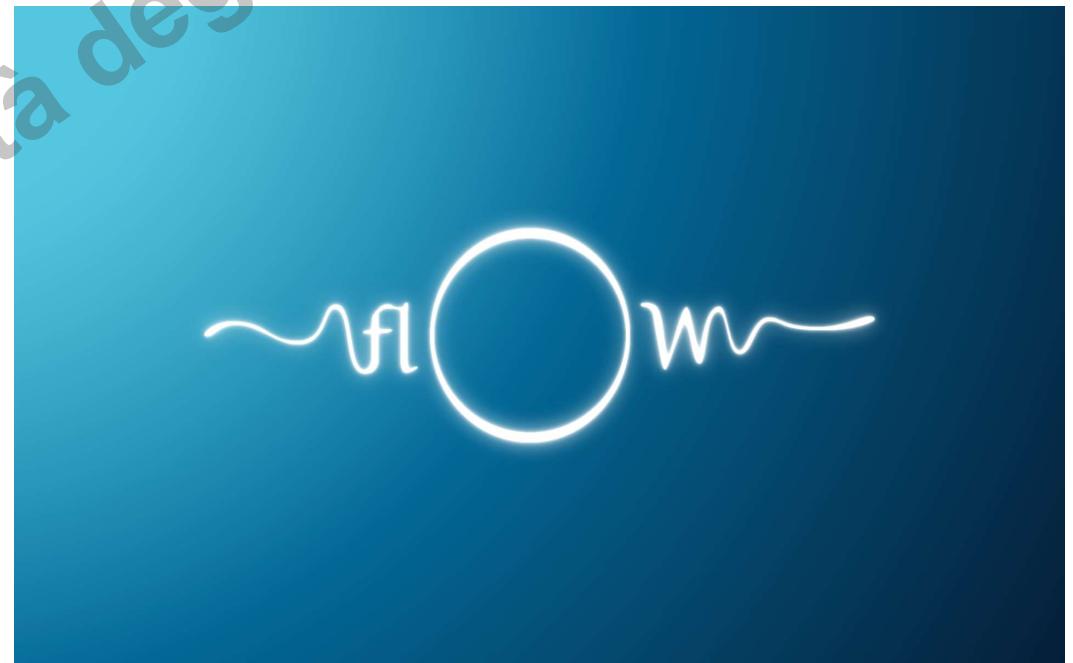
- Reasons for a game to become boring:
  - **too easy** player groks the game pattern in few minutes (tic-tac-toes)
  - **too hard** player can't grasp any pattern. The game is just noise
  - **it's repetitive** pace of variation in pattern too slow
  - **too hard too fast** pace of variation too quick
  - **I beat it** player masters completely the game pattern
  - **unuseful to me** too many variations in the pattern (tons of possible permutations, but below the player interest. E.g. learning baseball results of the last decades ...)



- NB: boredom it's the signal you have FAILED

**GOOD GAME** = teaches everything it has to offer before player stops playing

Having a lot of fun ...  
Flow



# Having *a lot* of fun

- And so what? ... how does it feel  
“having a lot of fun”?
- Players: “being in the zone”
- Academics: “flow”

“the state you enter when you are experiencing **absolute concentration on a task**. When you are in **absolute control**, the **challenges** that come at you are **met precisely by your skills**”



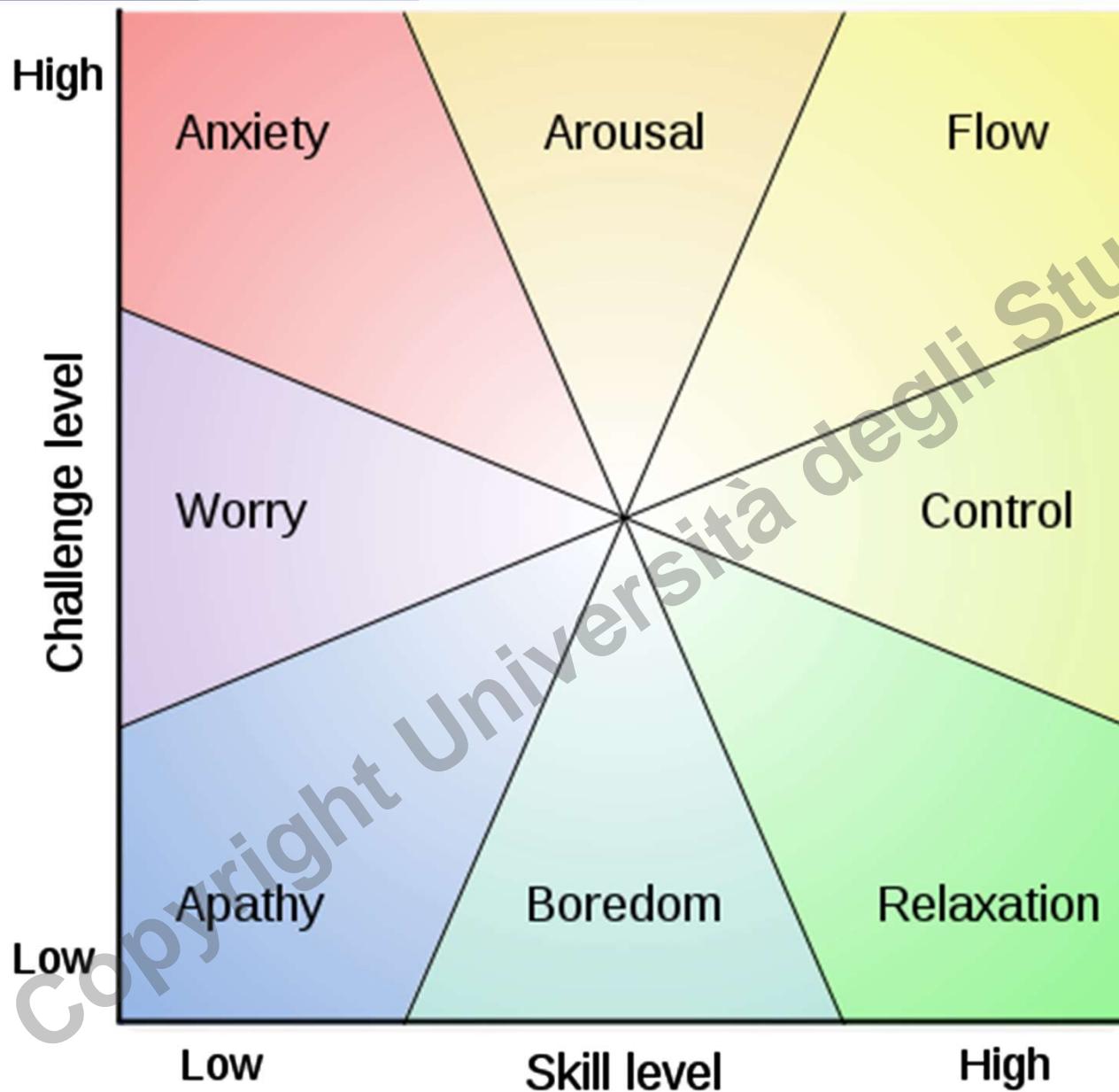
(M. Csikszentmihalyi “Flow: The psychology of optimal experience”)

# How does it feel to be in “flow”?

1. Completely involved in what we are doing  
- focused, concentrated
2. A sense of ecstasy -  
of being outside everyday reality
3. Great inner clarity -  
knowing what needs to be done, and how well we are doing
4. Knowing that the activity is doable -  
that our skills are adequate to the task
5. A sense of serenity -  
no worries about oneself and feeling of growing beyond the boundaries of the ego
6. Timelessness -  
thoroughly focused on the present, hours seem to pass by in minutes
7. Intrinsic motivation -  
whatever produces flow becomes its own reward



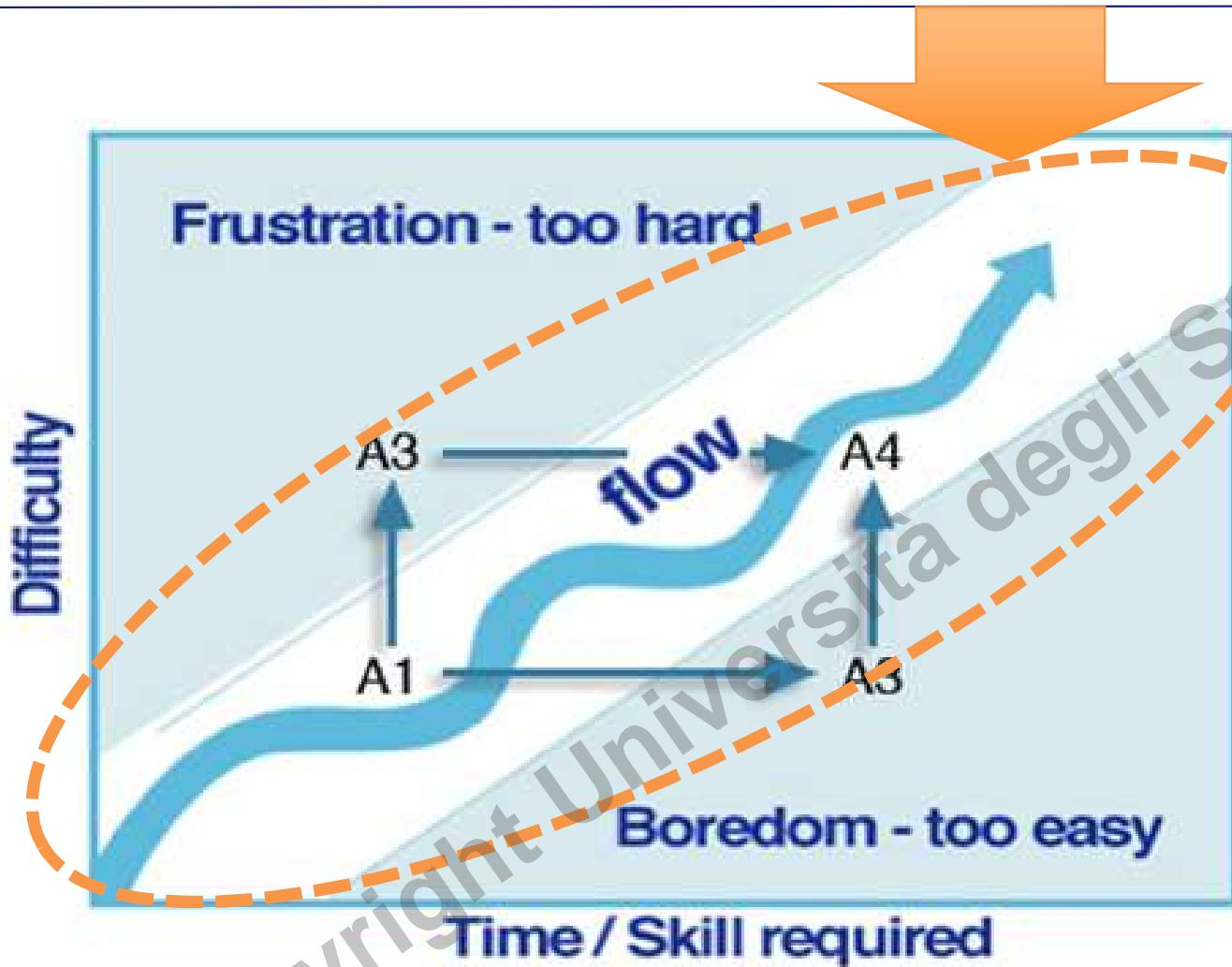
# Flow ...



M. Csikszentmihalyi  
“Flow: The  
psychology of  
optimal experience”

## Flow ...

### FLOW CHANNEL



The **DIFFICULTY** of the game **MUST** be in balance with the **SKILL** of the player:

- Too easy -> boring
- Too hard -> frustrating

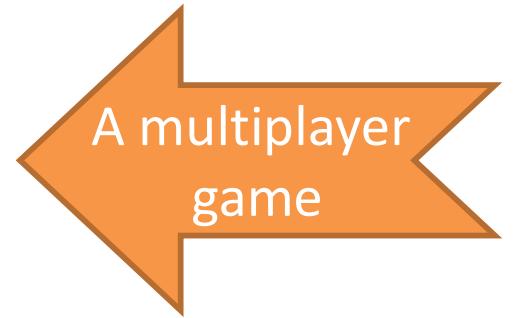
# A taxonomy of fun ...

Aesthetic,  
physical,  
social ...!

- FUN: the action of mastering *a problem* mentally
- Aesthetic appreciation: not necessarily fun, but certainly enjoyable
- Visceral reactions: related to physical mastery of a problem (u already know how to solve it ... no fun!)
- Social status maneuvers: intrinsic to our self-image and standing in a community ...



games



A multiplayer  
game

# Social interactions & emotions

- The constant **maneuvering for social status** that all humans engage in is a cognitive exercise (=> a GAME)
- Positive emotions (u “feel good”) related to interpersonal relations are signals of pushing someone else up/down in the social ladder:
  - **Schadenfreude**: when a rival fails at something (**a put down**)
  - **Fiero**: triumph for achieving a difficult task (**u are valuable**)
  - **Naches**: someone you mentor succeeds (**tribal continuance**)
  - **Kvell**: bragging about something u mentor (**u are valuable**)
  - **Grooming behaviours**: intimacy (**relative social status**)
  - **Feeding other people**: **social signal** in human societies

See also Nicole Lazaro works @  
<http://xeodesign.com/whyweplaygames.html>



# Social interactions & emotions

- Fun is **contextual**, and we get positive feedback from our brain from **climbing the social ladder**, but notice the difference:
  - Climbing **while helping others** (**naches** and **kvell**)
  - Climbing **while pushing the boundaries of our knowledge** (**fun**)
  - Climbing **while strengthening our social networks**, building communities/families (...guilds!?) that work together to improve everyone's state (**grooming**, **pairing** and **feeding others**)



What games teach

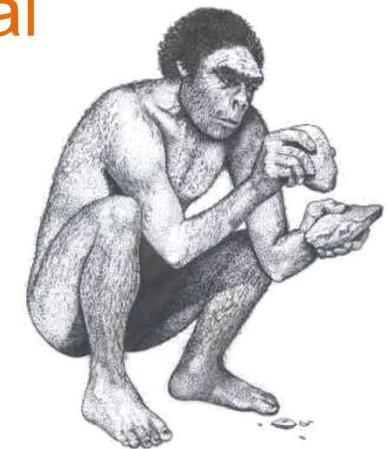


# There are many types of game ...

... each underlying a different pattern. They teach us:

- to predict events
- to deal with power and status
- Spatial relationships/reasoning
- Toolmaking
- Classification
- To explore possibility spaces
- To exercise memory
- Power
- teamworking
- Etc.

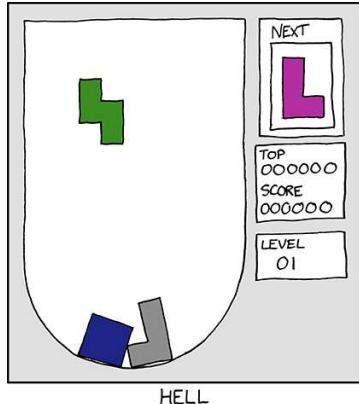
... mainly primitive skills, functional to survival



- Social interactions: manoevering for social status that all humans engage in is a cognitive exercise => essentially a game! => **VIRTUAL WORLDS** are fun!

# Some (video)games teach you ... (examples)

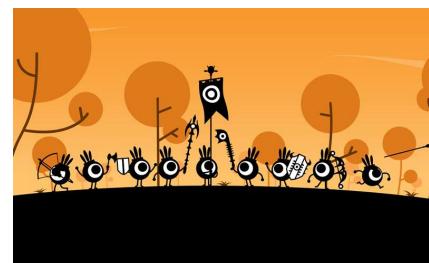
spatial relationships how to aim precisely



Team work ...!!



exploration



How to manage social relations



Eye-hand coordination

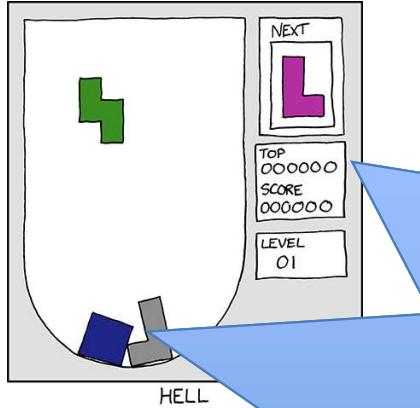


Resource allocation and management



# (video) games teach ...

Spatial relationships How to aim precisely



How to manage social relations



Team work



we have an art form on our  
hands that actually

## CHANGES BRAINS



Resource  
allocation and  
management

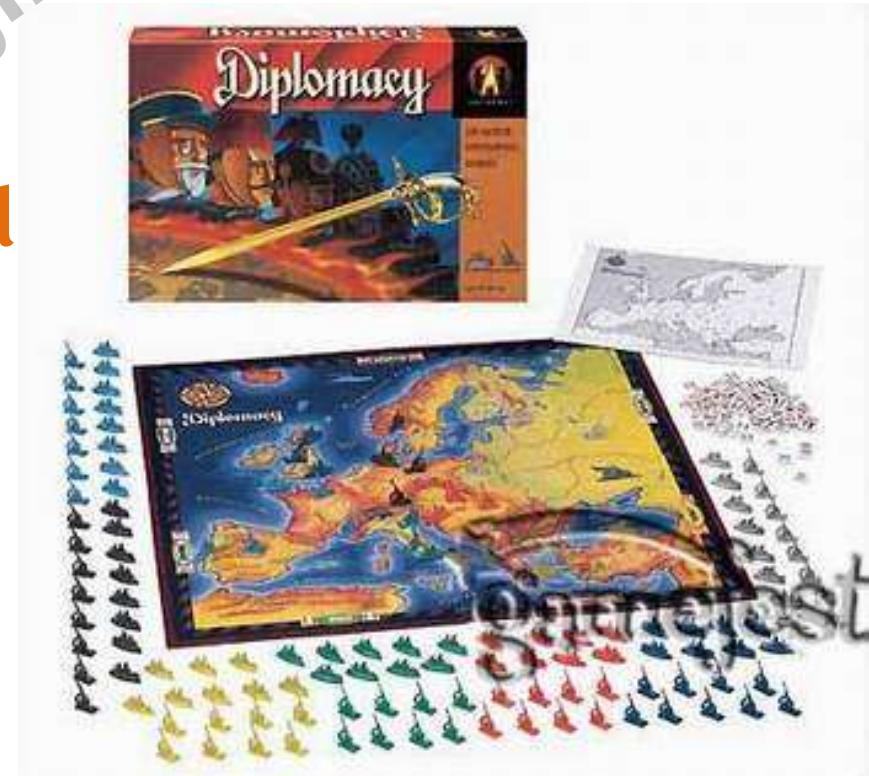
Etc. etc.

(video) games teach ...



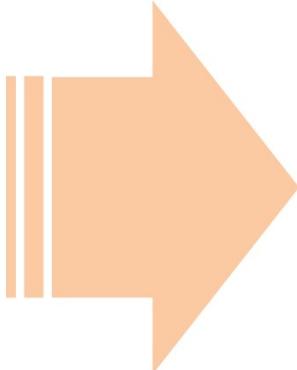
# Some games teach you ...

- Anyway games underpin **math structures**:
  - They can **excel at conveying only specific sets of contents**
  - They can be used **to model situations**  
(e.g. Diplomacy)



# Some games teach you ...

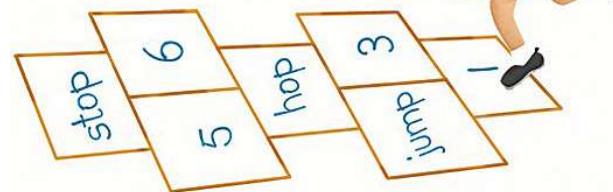
- But they may teach **obsolete skills**, among which also:
  - Blind obedience
  - Rigid hierarchies
  - Binary thinking
  - Force to solve problems
  - Xenophobia
  - ...



We have increased the *fidelity* of the simulation, not what we are simulating !

# Example: jumping through the ages

hopscotch

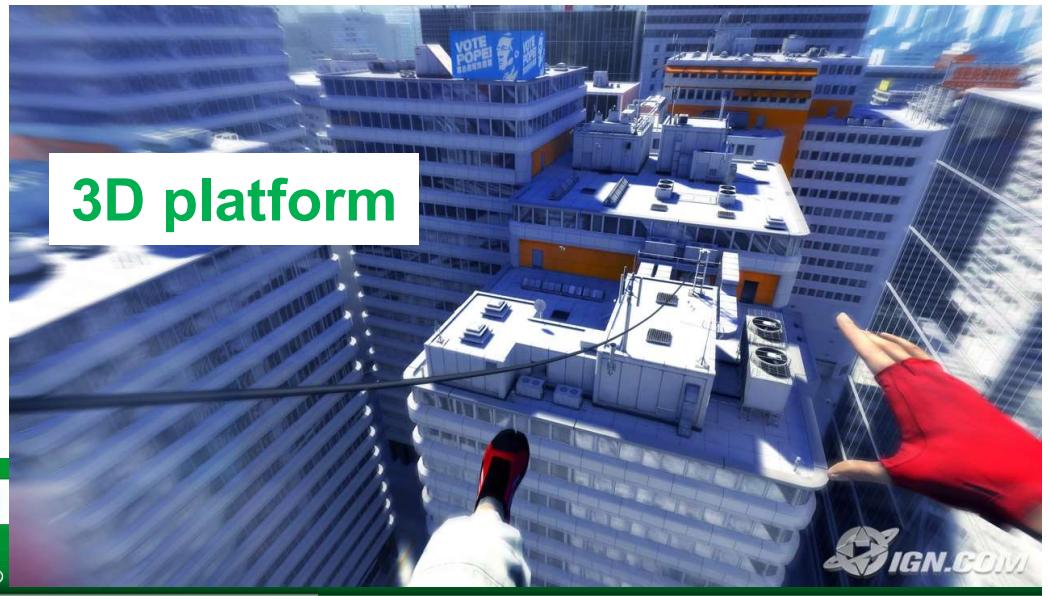


Jumping rope

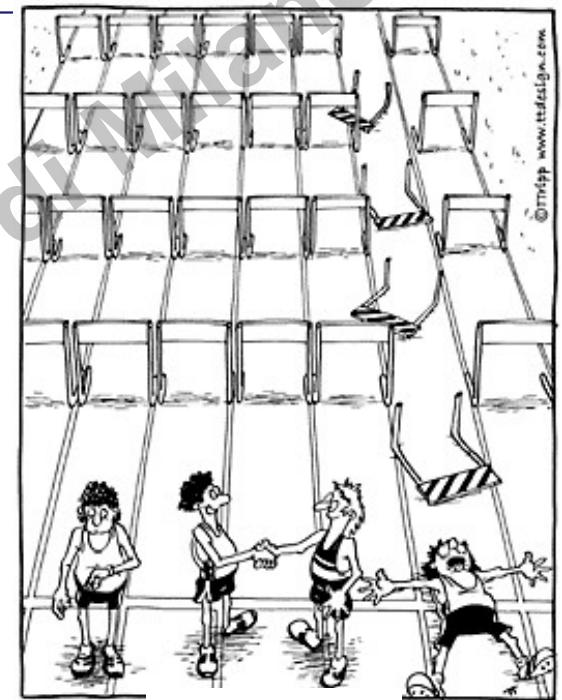
2D platform



3D platform

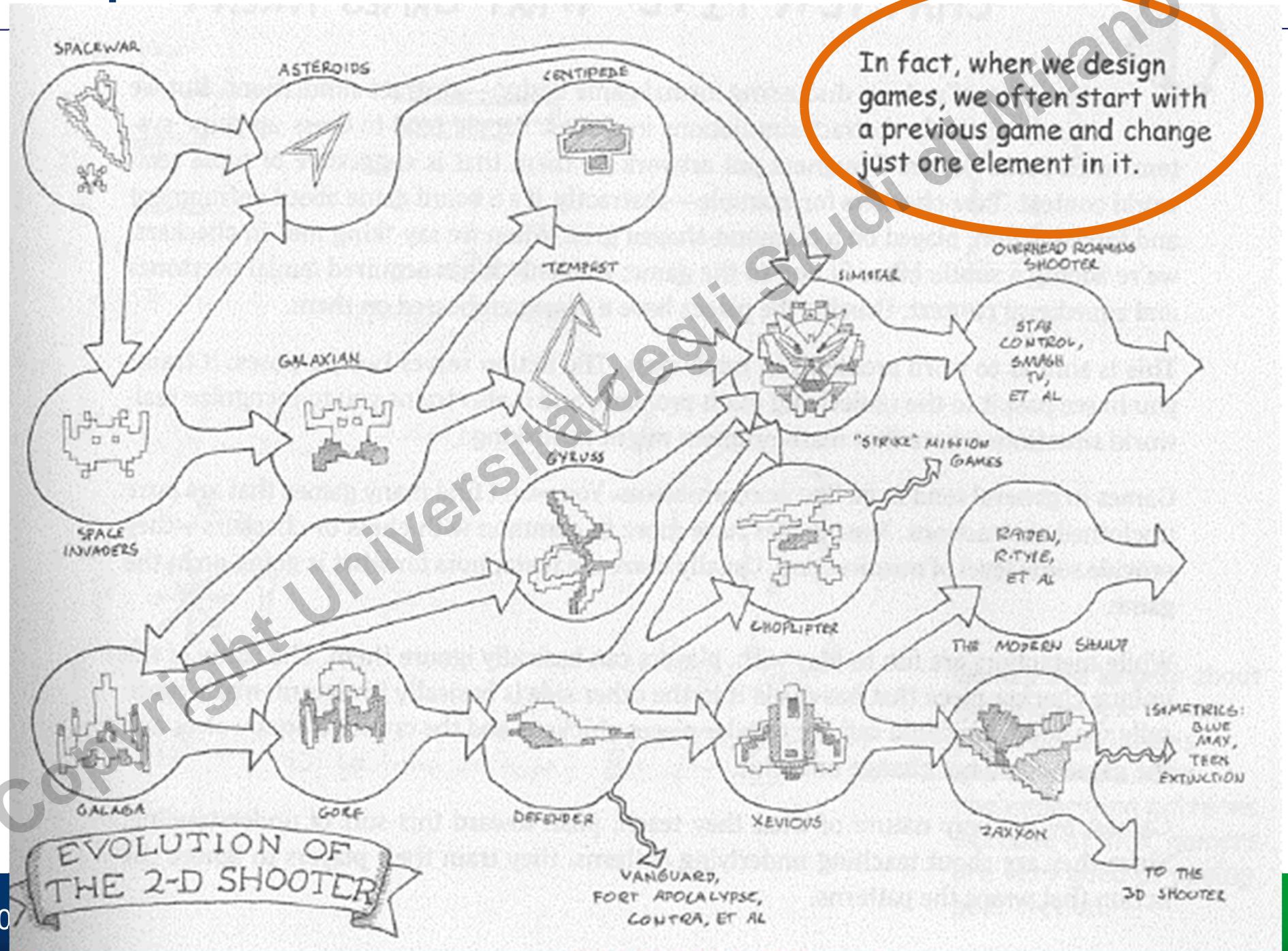


The Novice



hurdles

# Example: evolution of the 2D shooter

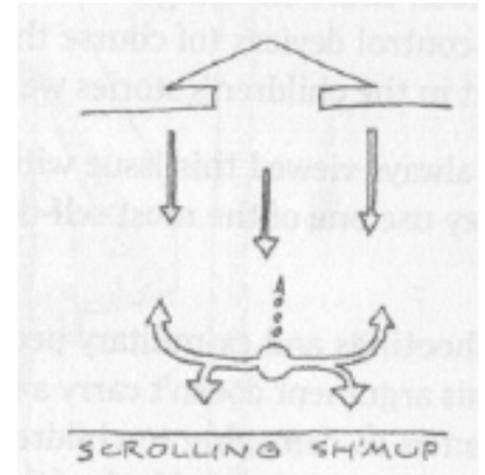
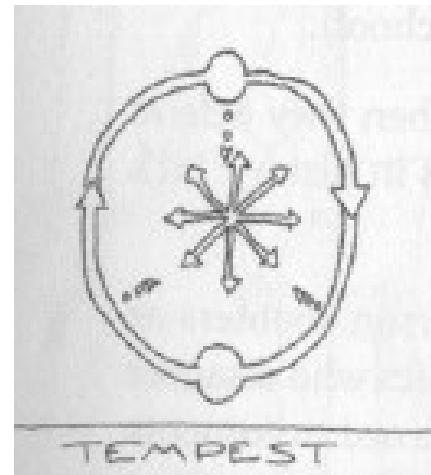
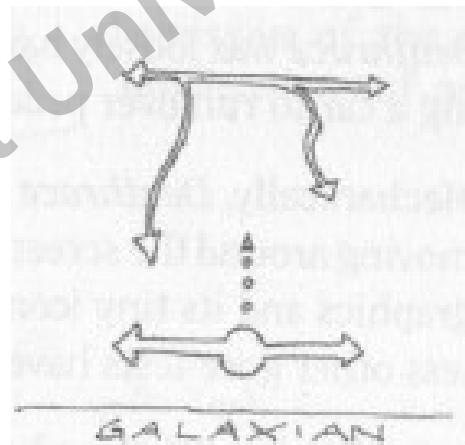
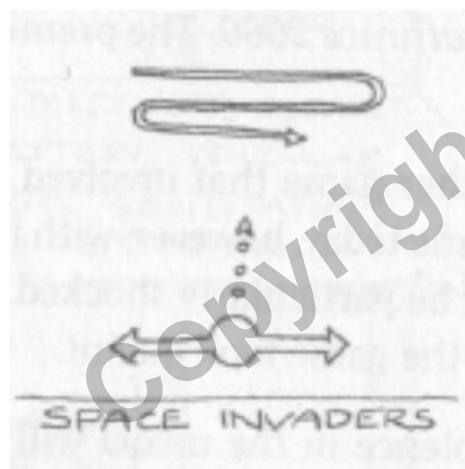


# What games aren't

- We rarely see abstract sims in games, they adopt **metaphors**. Artwork has 2 main purposes:
  - Teach u to see the math problem past the fiction
  - Teach u to spot the same problem in different contexts



**Games train you to IGNORE the fiction  
to find the underlying pattern**



# «Virtual worlds»



# Virtual worlds: a definition

- “A VW is any computer-generated **physical space** that can be experienced by many people at the same time” (Castrónova, 2005)
- “VWs are places of **human culture** realized by computer programs through the Internet” (Boellstorff, 2008)



- Hence VWs are (at least):
  1. Places
  2. Inhabited by persons
  3. Enabled by online technologies



# Virtual worlds: a definition

- “It's a **SERVICE**. Not a game.  
It's a **WORLD**. Not a game.  
It's a **COMMUNITY**. Not a game.  
Anyone who says, “it's just a game” is missing the point.”
- “A [MUD] universe is all about **psychology**. After all, there IS no physicality. It's all psych and **group dynamics**.”

*Form: <http://www.raphkoster.com/gaming/laws.shtml>*



# The Metaverse

5-6 hours/day on smartphone + streaming services +  
games + laptops + TV + ... ... **it's easier to count the hours  
we DON'T spend interacting with the Internet**

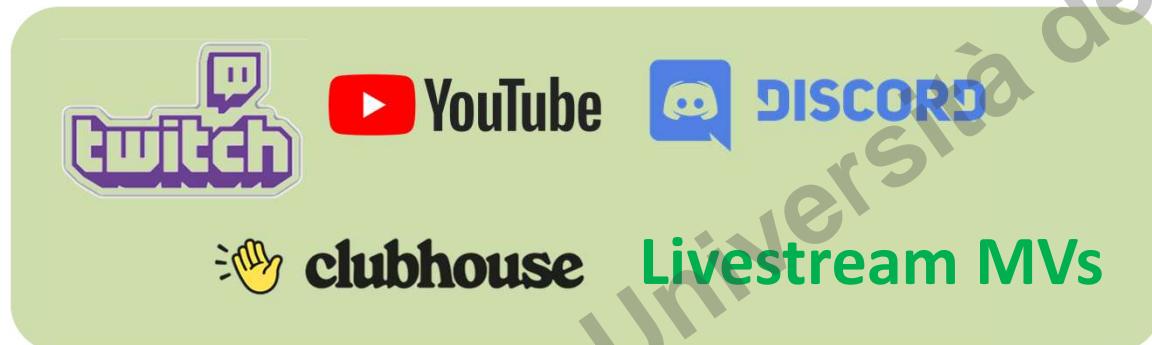
- Communities & areas where we spend our time (will) have digital component of some type ...



- The Internet is our collective livelihood & the **Metaverse** it's (likely) evolution



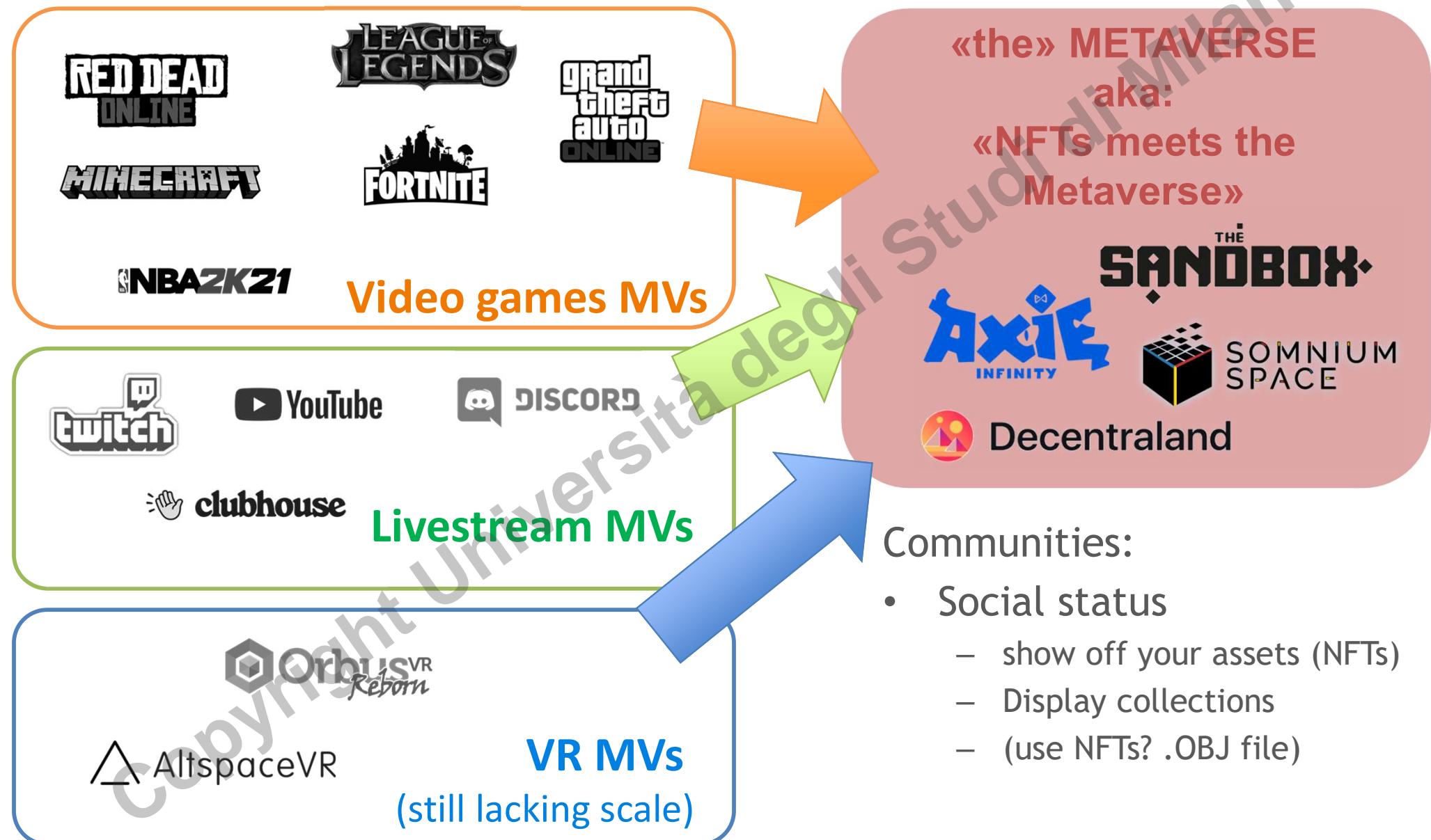
# Different «types» of metaverse(s)



Shared traits:

- Distributed
- Communities
- Simultaneous social experiences
- Shared interests/goals
- Hierarchies of participants

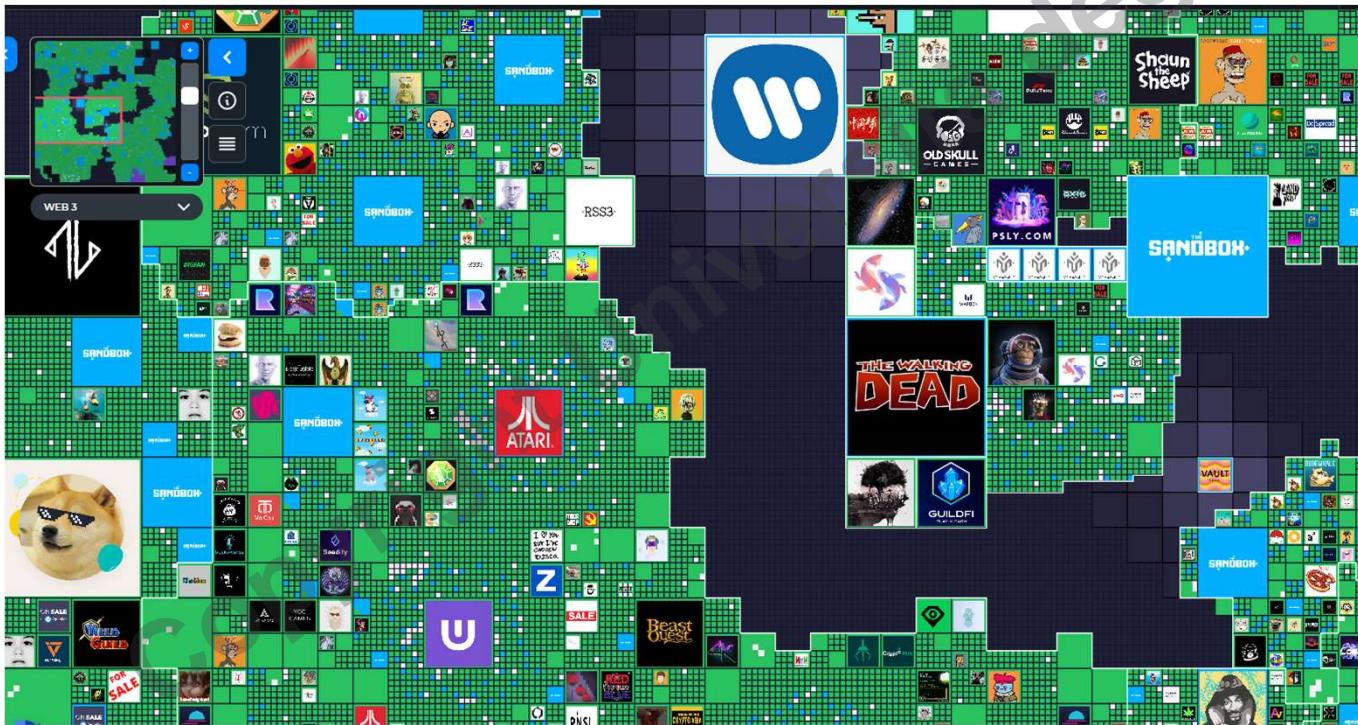
# Different «types» of metaverse(s)



# The Sandbox (<https://www.sandbox.game/en/>)

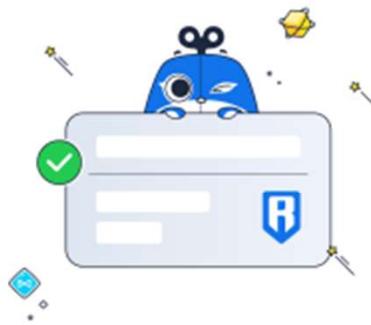


- Ethereum-based
- Play, explore, interact, etc.
- You can buy land and personalize it, lease it, etc.

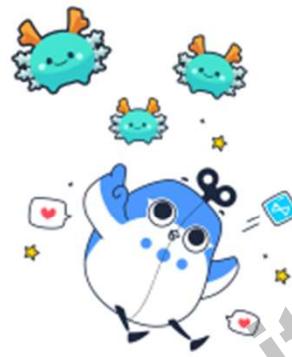


THE  
SANDBOX

# Axie Infinity (<https://axieinfinity.com/>)



1. Create Ronin Wallet



2. Get Axies



3. Account Creation



4. Download & Play

## Getting Started With Axie

Axie Infinity is a virtual world full of fierce, adorable pets called Axies. Axies can be battled, collected, and even used to earn cryptocurrencies with real value. Let's learn how to set up your digital wallet, buy Axies, and download the game.