

PLAYER MODELLING AND ONLINE GAMING

Dr. Lauren S. Ferro Ph.D

WHO AM I?

Prof.ssa Graphic and Game Design

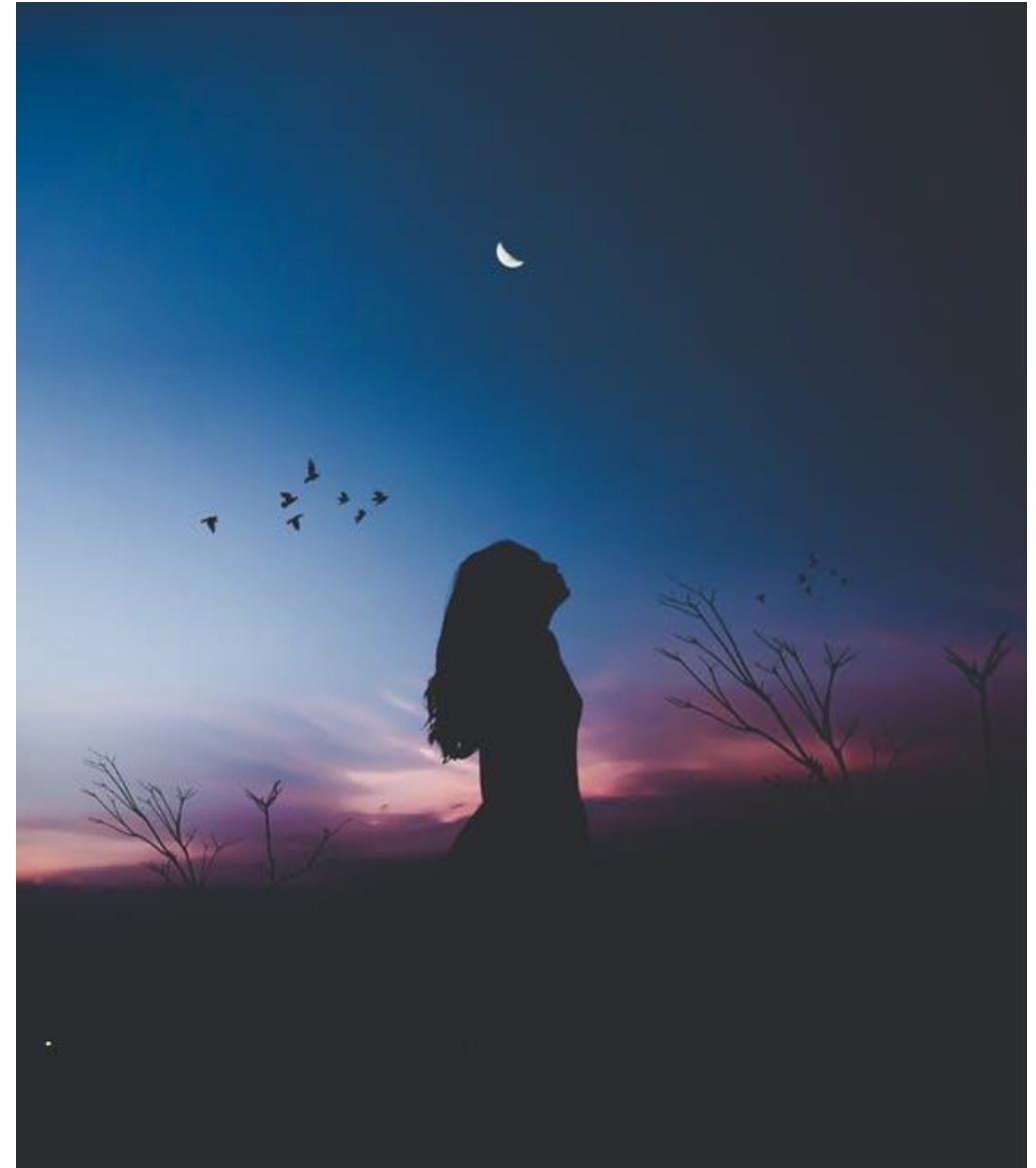
Graphic designer and gamer

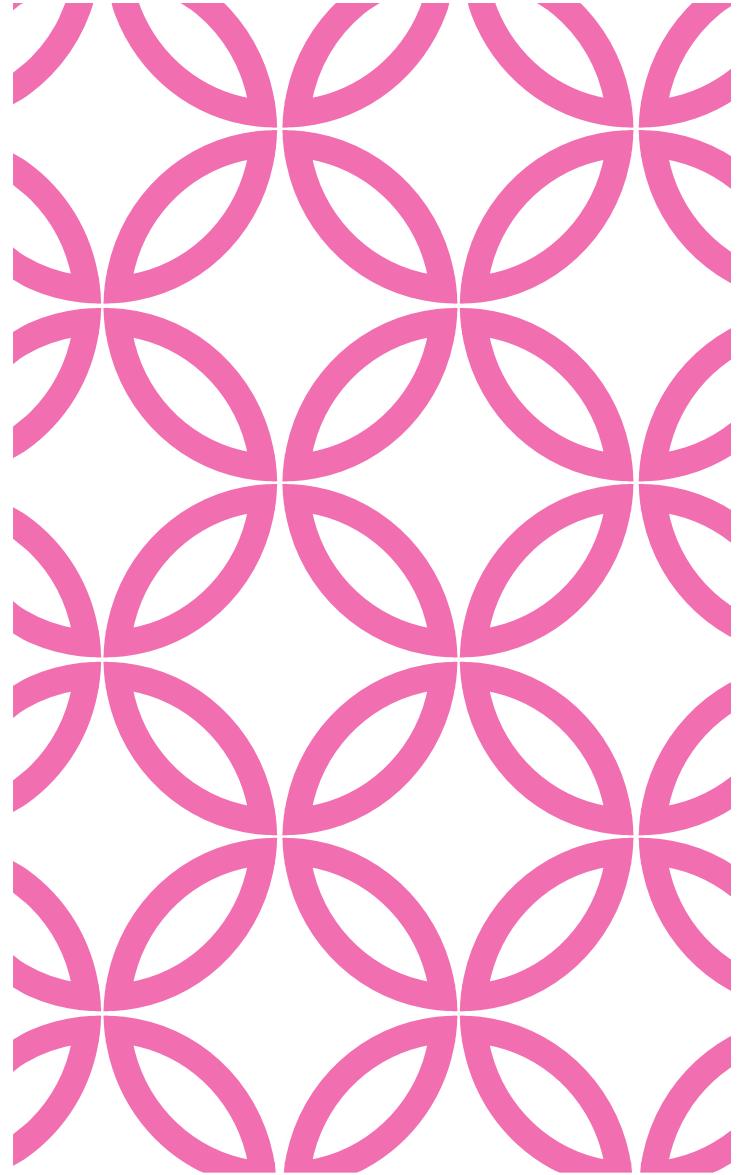
Game designer and technical artist

PhD in player modelling and
profiling

Consultant for game user
experience and design

Co-Leader of the Unreal Engine
Meetup - Rome





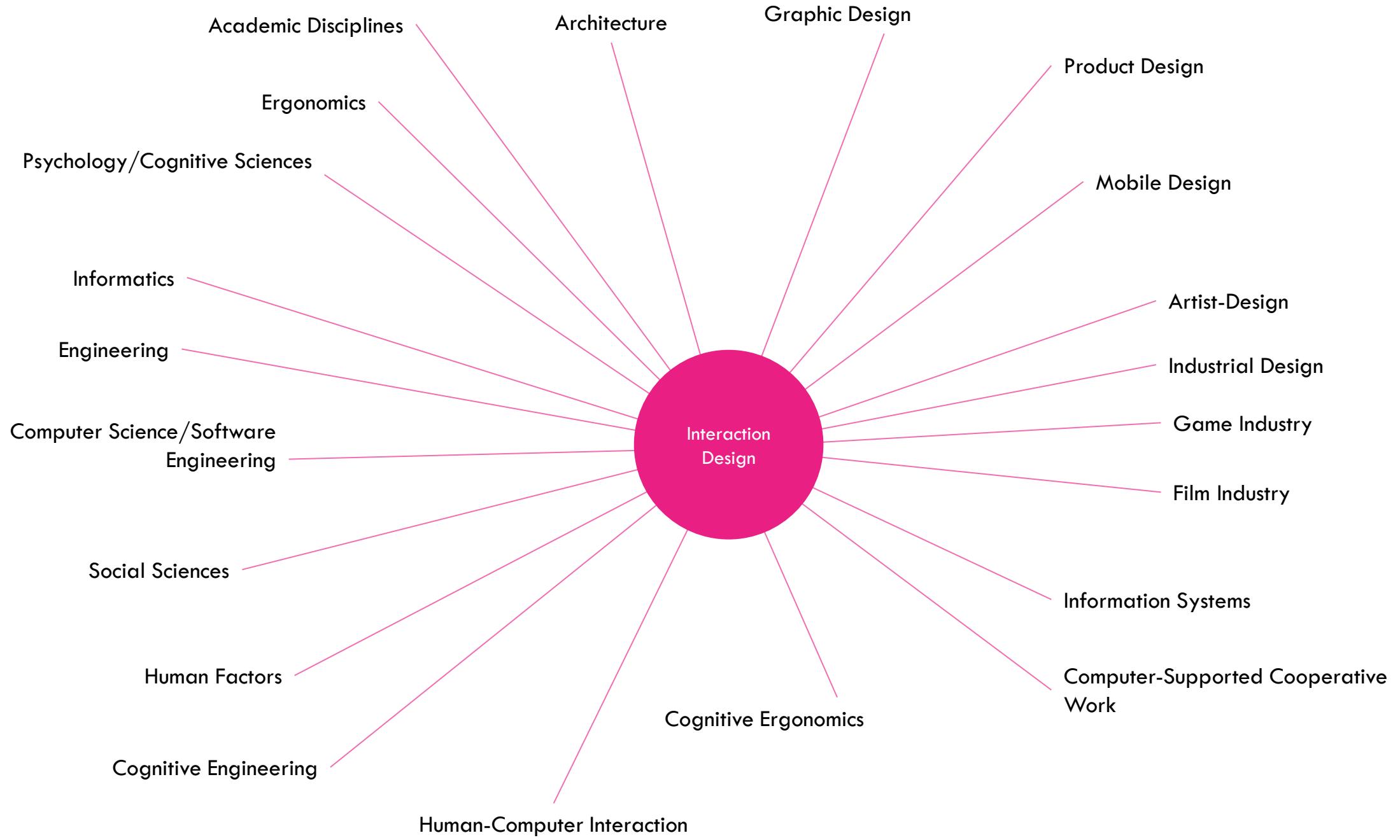
INTERACTION DESIGN
IS ABOUT *INTERACTION*

INTERACTION DESIGN

- Interaction Design defines the **structure** and **behavior** of interactive systems.
- It is the design of **interactive products** to **support** people in their **everyday** and **working** lives.
- By creating user experiences that enhance and extend the way people work, communicate and interact.
- Interaction designers can create **meaningful relationships** between people and the products and services that they use (computers, mobile devices, appliances, and many others).
- *Interaction Design Association:*
<http://ixda.org/>
- *Interaction Design Foundation:* <https://www.interaction-design.org/>

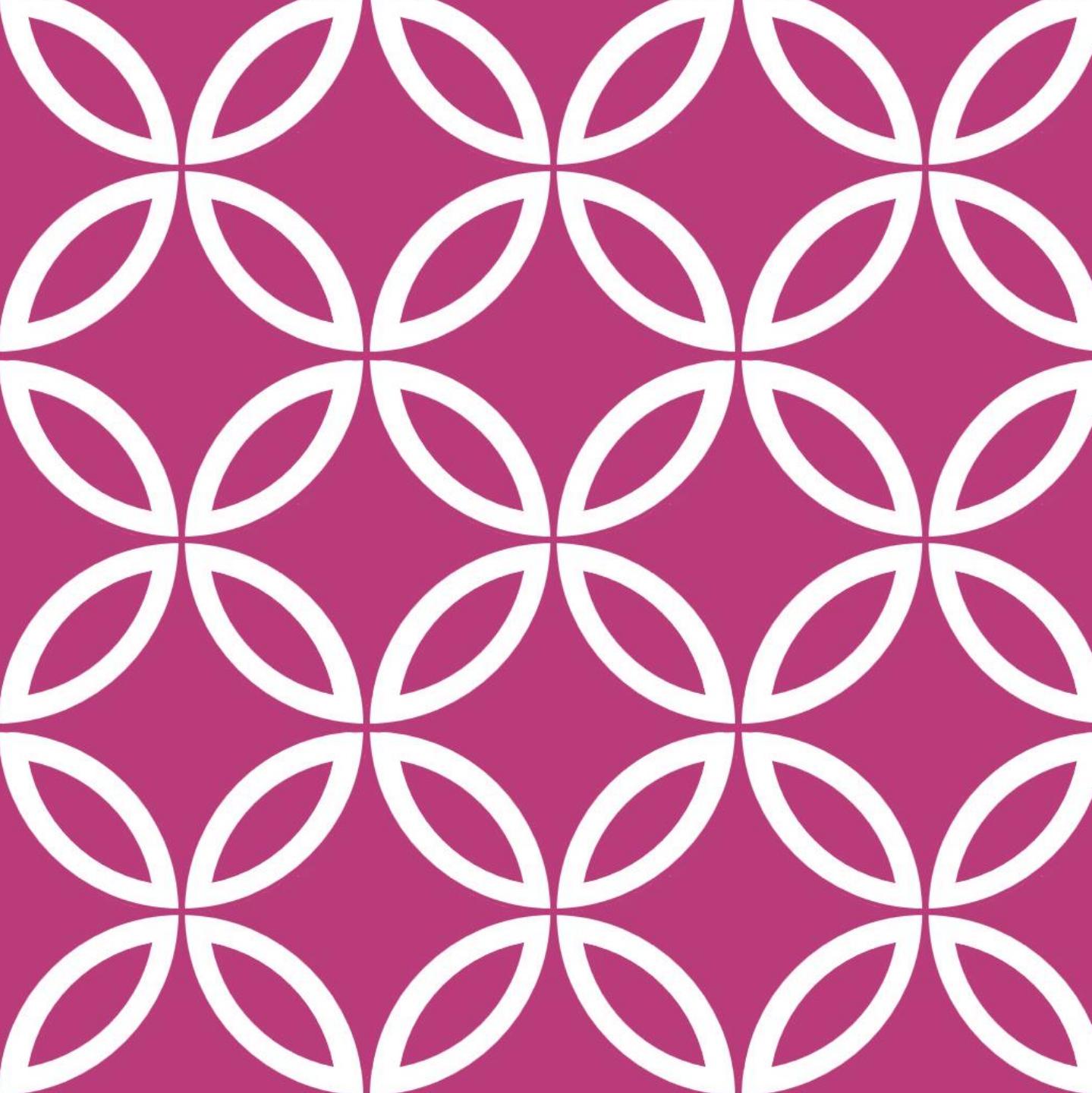


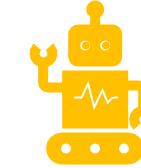
INTERACTION DESIGN
FOUNDATION



WHY IS THIS IMPORTANT?

Understanding *how* users and technology communicate with each other is fundamental to anticipate how someone might interact with the system, fix problems early, as well as invent new ways of doing things.





BUT!

There are *different types* of interaction





There are lots of different types of experiences that ***you can create***.



You can ***take people to places*** that they might ever visit.



We can be ***a part of history*** instead of hearing or reading about it.

**TO *INTERACT* REQUIRES
*INPUT***

INPUTS



Cameras



Microphones



Traditional interfaces
such as mouse and
keyboard



Touch screens



All kinds of sensors
such as motion,
temperature, light



Natural User
Interfaces (NUIs)
(e.g. multi-touch iPad)

INPUTTING
INFORMATION
RESULTS IN AN *OUTPUT*

OUTPUTS

Screens

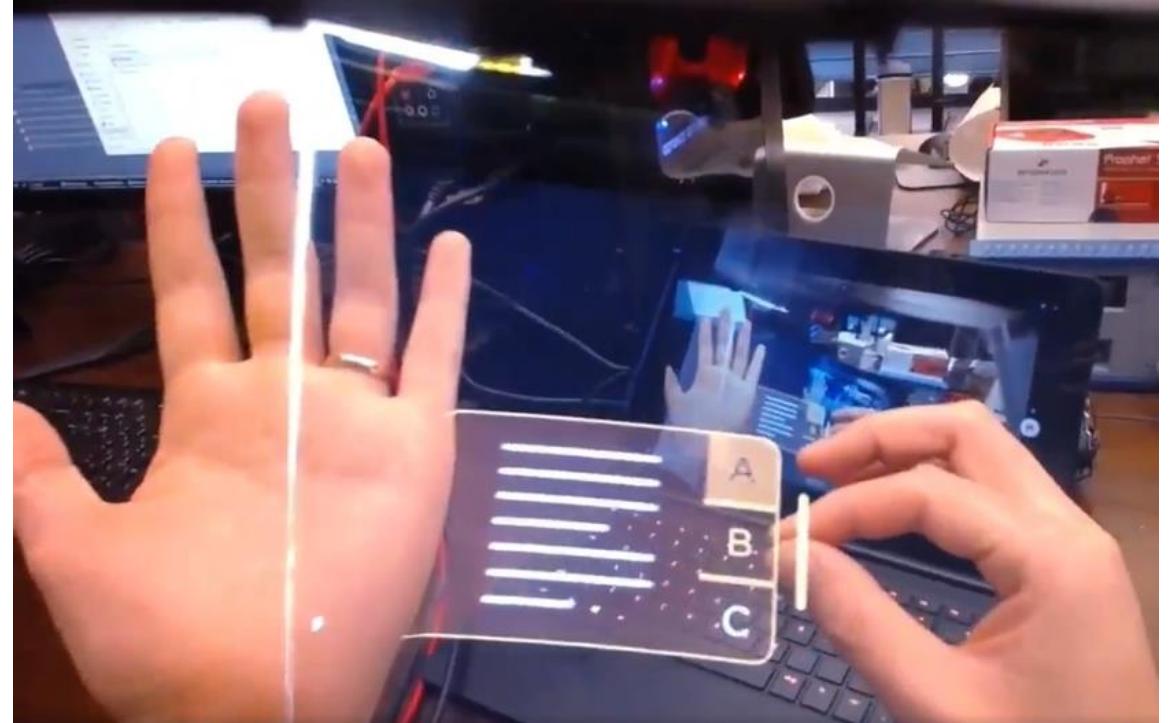
Projection on “flat” surfaces

Video/Projection mapping

..but also

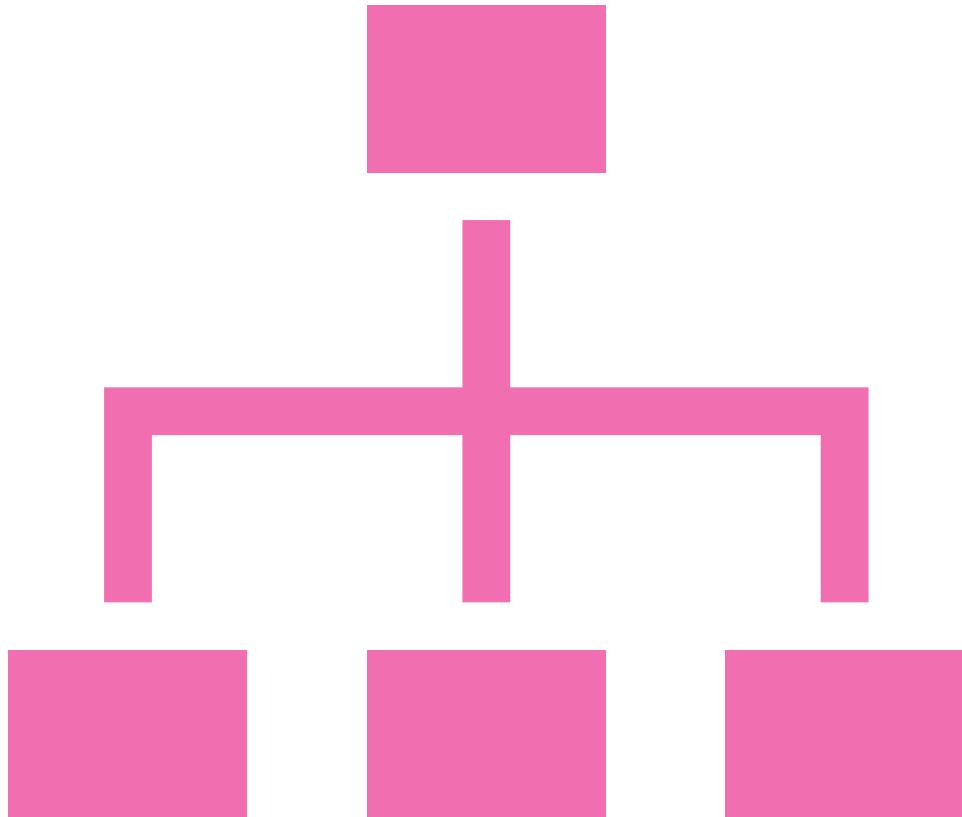
Augmented reality

Virtual reality



Why is Interactive Design *important*?
It is involved in *everything* that we do.

IXD PROCESS



*What is **involved** in the process of interaction design?*

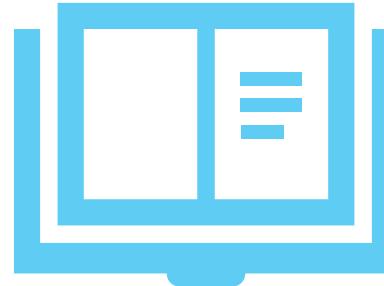
1. Identifying needs and establishing requirements.
2. Developing alternative designs that meet those requirements.
3. Building interactive versions of the designs so that they can be communicated and assessed.
4. Evaluating what is being built throughout the process.

IXD PRINCIPLES

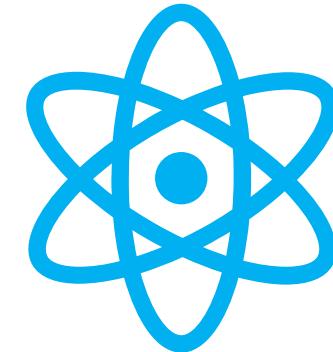
Normans Principles



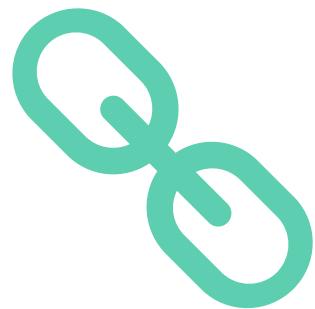
Visibility



Feedback



Consistency



Constraints



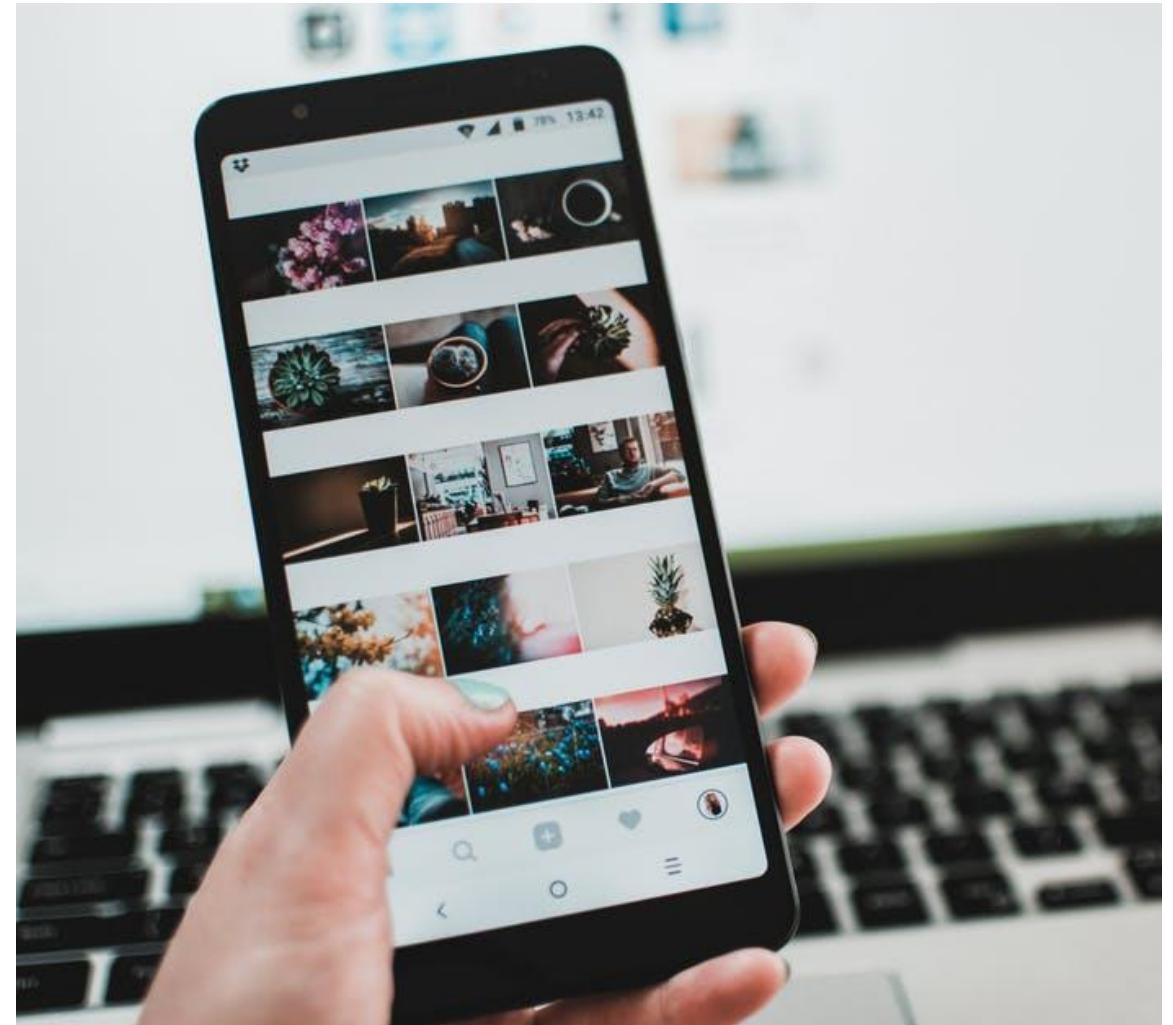
Mapping



Affordance

VISIBILITY

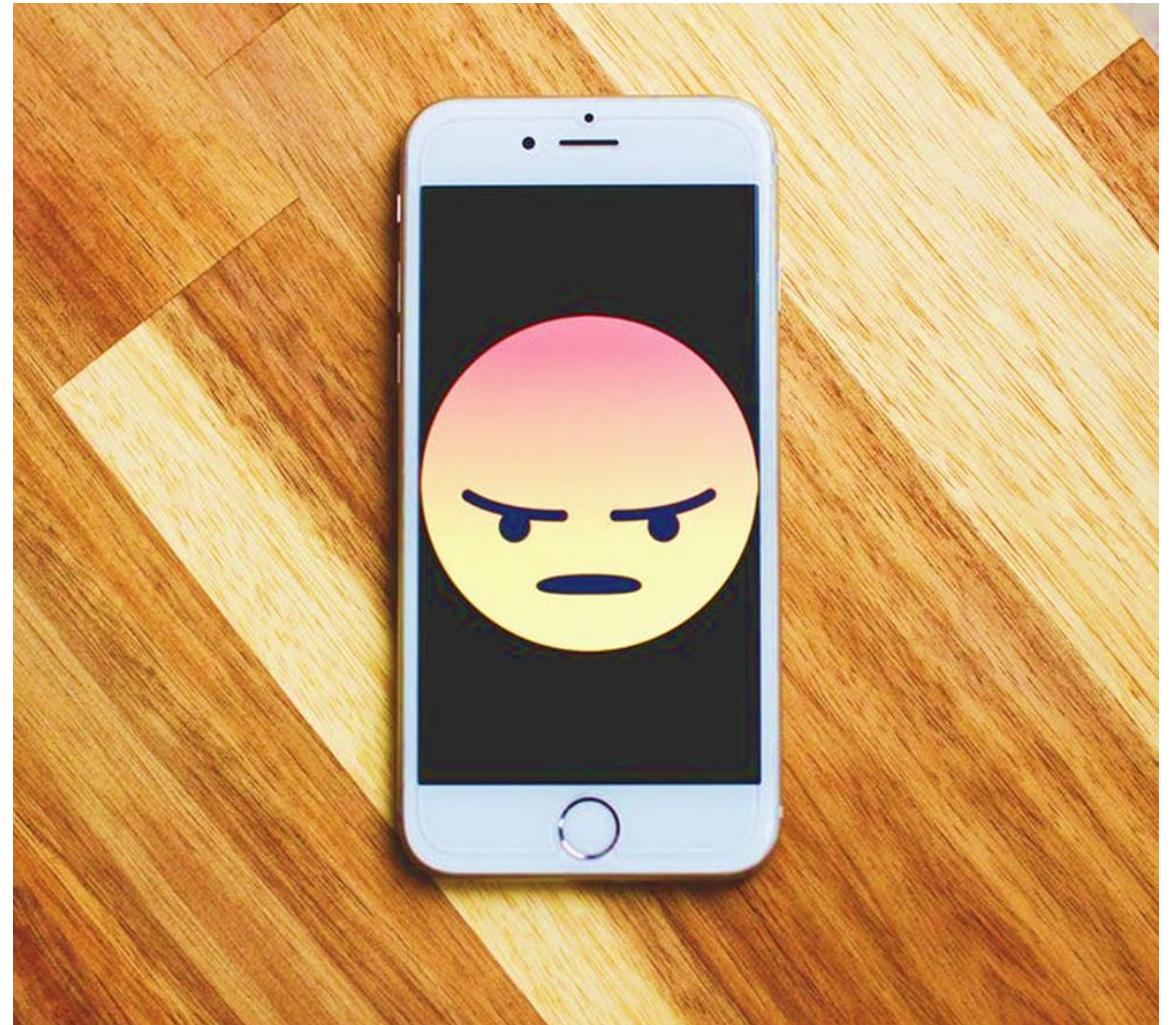
Users need to know what is available and how to access it straight away. The more visible something is the more likely users will pay attention/notice to it.



FEEDBACK

Every action needs to have a reaction such as a sound, a rotating hour glass, a spinning rainbow wheel, to indicate to a user that something has occurred.

It is really ***important*** to provide feedback to the actions that users make.



CONSTRAINTS

Constraints are the limits to an interaction or an interface. Some are really obvious and physical, for example the screen size on a phone. Others are more passive, like a single, continuous page website having an image peeking onto the main page.



CONSISTENCY

The same action has to cause the same reaction, every time. You also need to take into consideration what the user is used to.

It allows us to utilise what the user *already knows*.



MAPPING

Mapping is the relationship between control and effect.

The idea is that with good design, the controls do something that will (or at least) closely **resemble** what they affect.



AFFORDANCES

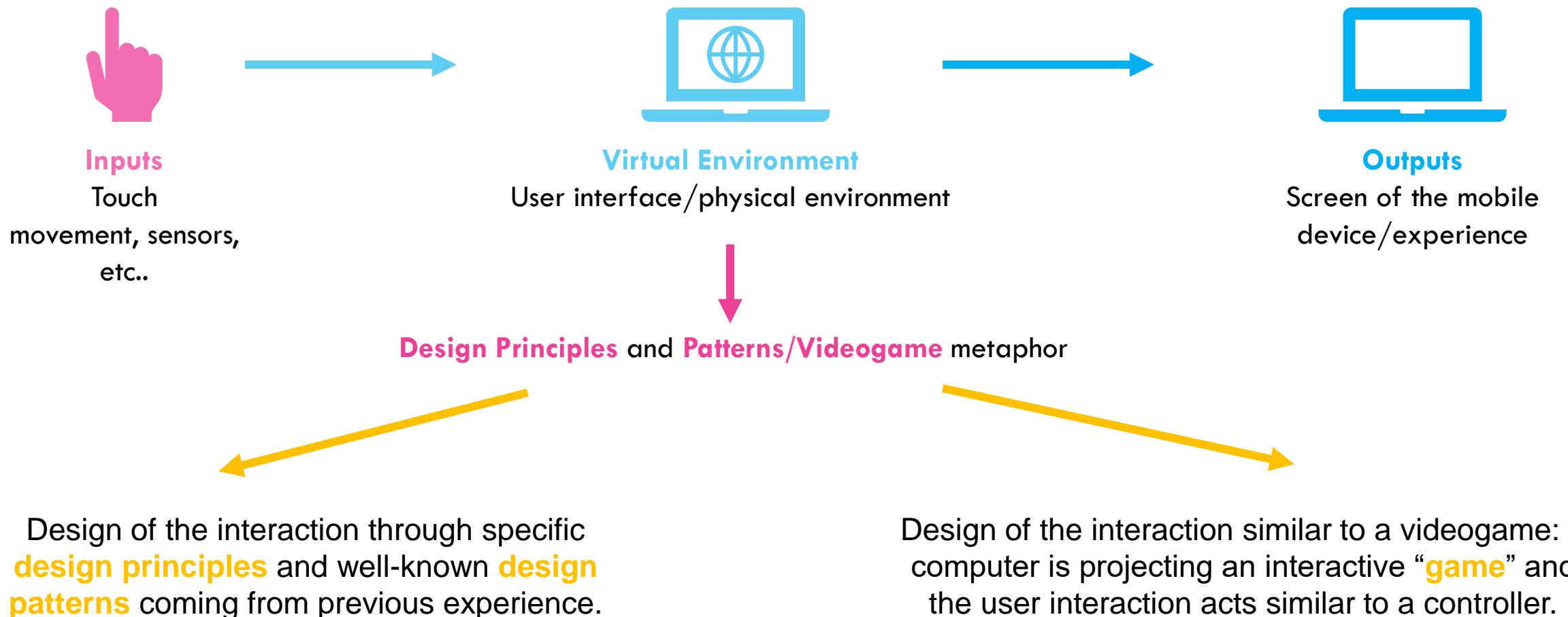
Affordance is the relationship between what something looks like and how it's used.

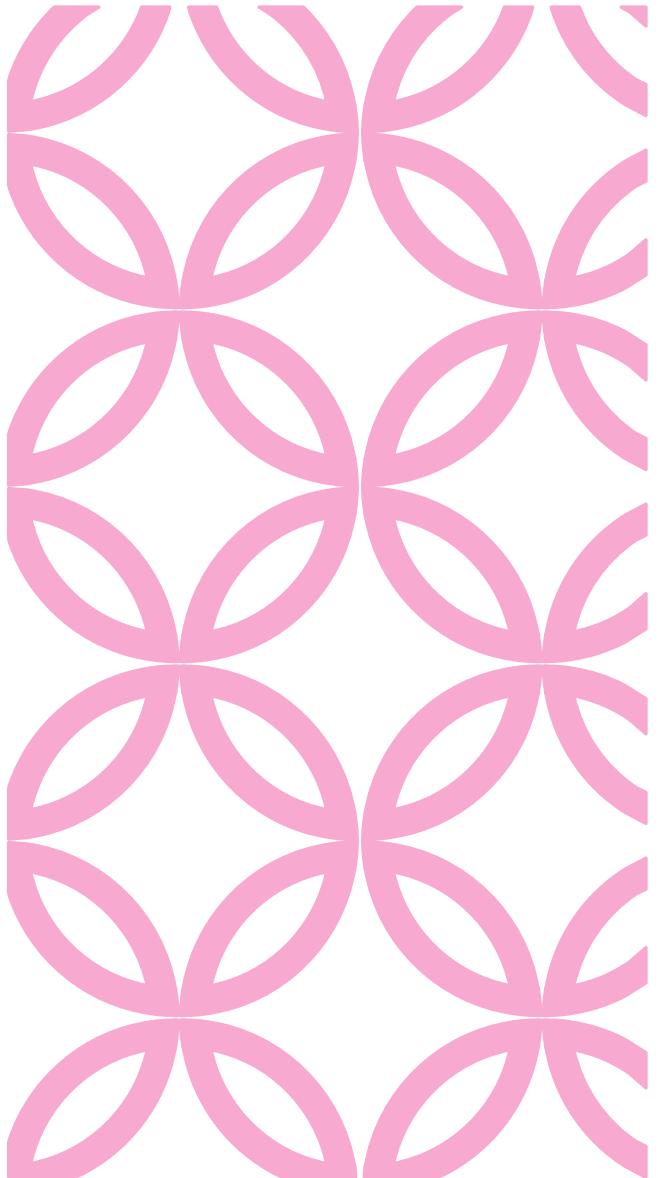




THE INTERACTION |

INGREDIENTS FOR INTERACTION





The purpose of an interactive system is to **help** a user in accomplishing goals from some application domain.

A domain defines an area of expertise and knowledge in some real-world activity, and consists of concepts that highlight its important aspects.

For example, in a graphic design domain, some of the important concepts are geometric shapes, a drawing surface and a drawing utensil.

Tasks are operations to **manipulate** the concepts of a domain.

One task within the graphic design domain is the construction of a specific geometric shape on the drawing surface.

A goal is the desired output from a performed task.

A goal is to produce a solid red triangle centered on the canvas.

THE TERMS OF INTERACTION

DONALD NORMAN'S MODEL

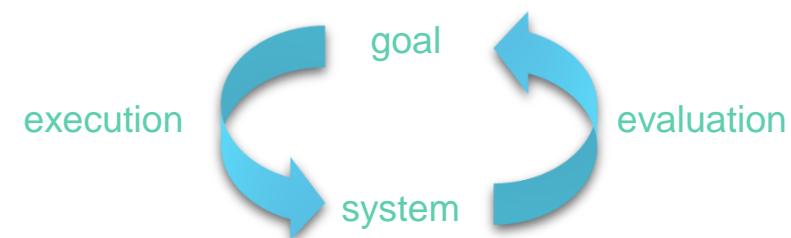
It is perhaps the most *influential* model of interaction in HCI.

It consists of an *interactive cycle* that captures the user's view of the interface. It consists of two major phases: *execution* and *evaluation*.

The two major phases can be subdivided into further 7 stages:

- *User establishes the goal*
- *Formulates intention*
- *Specifies actions at interface*
- *Executes action*
- *Perceives system state*
- *Interprets system state*
- *Evaluates system state with respect to goal*

The user formulates a plan of action, which is then executed at the computer interface. Then, the user observes the interface to evaluate the result of the executed plan, and to determine further actions.



USING NORMAN'S MODEL

It can be used to demonstrate **why some interfaces cause problems** to their users. Norman describes these in terms of the gulfs of execution and gulfs of evaluation.

- The gulf of execution is the difference between the user's formulation of the actions to reach the goal and the actions allowed by the system.
- If the **actions allowed** by the system correspond to those intended by the user, the interaction will be effective.
- The **interface should therefore** aim to reduce this gulf.
- If the user can **readily evaluate** the presentation in terms of his goal, the gulf of evaluation is small.
- The **more effort is required** to the user for interpreting the presentation, the less effective the interaction.

HUMAN ERRORS — SLIPS AND MISTAKES

Human errors are often classified into slips and mistakes. We can distinguish these using Norman's gulf of execution.

- The gulf of execution is the gap between a user's goal for action and the means to execute that goal.

If you understand a system well you may know exactly what to do to satisfy your goals. However, perhaps you mistype or you accidentally press the mouse button at the wrong time. These are called *slips*; you have formulated the right action, but fail to execute that action correctly.

However, if you don't know the system well you may not even formulate the right goal. For example, you may think that the zoom icon is the 'find' function, but in fact it is to zoom the text. This is called a mistake.

If we discover that an interface is leading to errors it is important to understand whether they are slips or mistakes.

- *Slips may be corrected* by, for instance, better screen design, perhaps putting more space between buttons.
- However, mistakes need users to have a *better understanding of the systems*, so will require far more radical redesign or improved training.

ERGONOMICS

Study of the physical characteristics of interaction:

how the controls are designed?

in which physical environment the interaction takes place?

how are the layout and physical characteristics of the screen?

A primary focus of ergonomics is on user performances and how the interface enhances or detracts such performances.

In the context of HCI, ergonomics is very good at defining standards and guidelines for constraining the way we design certain aspects of systems.

THE DESIGN OF EVERYDAY THINGS

previously published as
THE PSYCHOLOGY
OF EVERYDAY THINGS



PHYSICAL ARRANGEMENT OF CONTROLS AND DISPLAYS

It is crucial that the physical layout of controls and parts of the display are grouped logically to allow rapid access by the user.

- In **safety-critical** applications such as plant and air traffic control, users are under pressure and are faced with a huge range of displays and controls.
- In less critical PC applications, **inappropriate placement** of controls and displays can lead to inefficiency and frustration (for example, a poor design frequently leads to inadvertent removal actions).



THE USE OF COLOR

The use of color in **displays** is an ergonomics **issue**.

The human visual system has some limitations with regard to the number of colors that are distinguishable and the relatively low blue acuity.

Some **ergonomic guidelines**:

Colors used in the display should be as distinct as possible and the distinction should not be affected by changes in contrast.

If color is used as an **indicator** it should not be the only cue: additional coding information should be included.

The colors used should **correspond** to common conventions and user expectations (which should not be violated without very good cause).

Blue should not be used to display critical information.

Red, **green** and **yellow** are colors frequently associated with stop, go and standby respectively. Therefore, red may be used to indicate emergency and alarms; green, normal activity; and yellow, standby and auxiliary function.

Color **conventions** are **culturally** determined; awareness of such conventions is very important in designing systems for a global market.

For example, red is associated with danger and warnings in most western cultures, but in China it symbolizes happiness and good fortune.



INTERACTION STYLES

The choice of interface style can have a profound effect on the nature of the HCI.

There are a number of traditional interface styles including:

command line interface

menus

question/answer and query dialogue

form-fills and spreadsheets

point and click

WIMP

Tactile, vocal, 3D interfaces and many more!



MENU INTERFACES

In a menu-driven interface, the options available to the user are displayed on the screen and selected with the mouse or numeric/alphabetic keys.

Often menus are hierarchically ordered and the option required is not available at the top layer of the hierarchy.

Grouping and naming of menu options then provides the only cue for the user to find the required option.

This form of interaction is less demanding for the user, which relies on recognition rather than recall.

However, menu options need to be meaningful and logically grouped to aid recognition.

PAYMENT DETAILS

P3-7

please select payment method:

1. cash
2. check
3. credit card
4. invoice

9. abort transaction

Ravenous
The pirates of the "Ravenous" can tell you more about Kellach's plans.

Meet them at the Lionbridge Expanse.

Aid Fort Salma. (23)

Help battle the centaurs, disarm their traps, and repair the damage from their assaults.

The Battle of Fort Salma

raph forces are engaging the centaurs at Jallwatcher and the southern bridge crossing.

Derveth [KOFR]



Inventory [B]

27/52

Search...



- Deposit All Collectibles
- Compact
- Show / Hide Bags

- Guild + PMs +
- Psius: he means, expanding the window
- Setsuna F Seiei: open Inventory, gear icon on top right under options
- Setsuna F Seiei: show/hide to make all bags condensed into one
- Lokket: ahhh
- Setsuna F Seiei: and then bottom right arrows on inventory window
- Setsuna F Seiei: to expand the inventory window frame

[Guild]

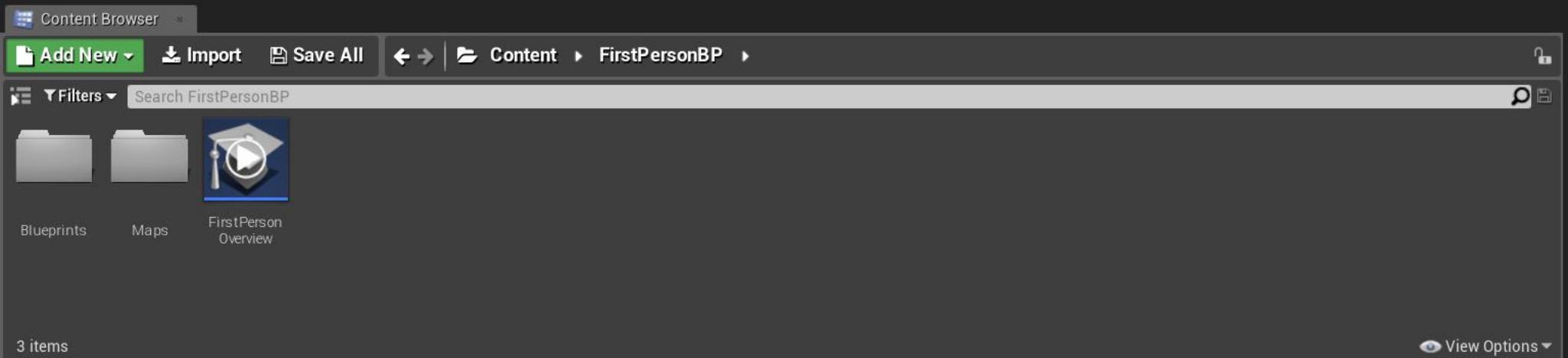
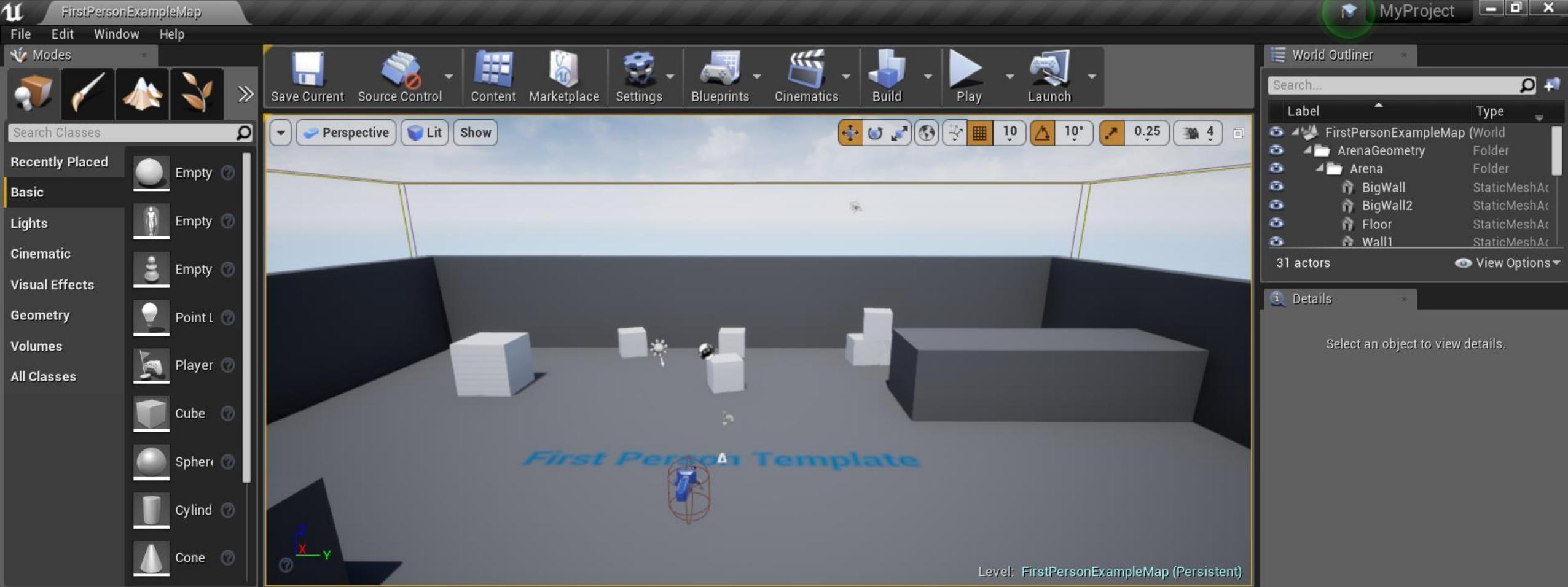


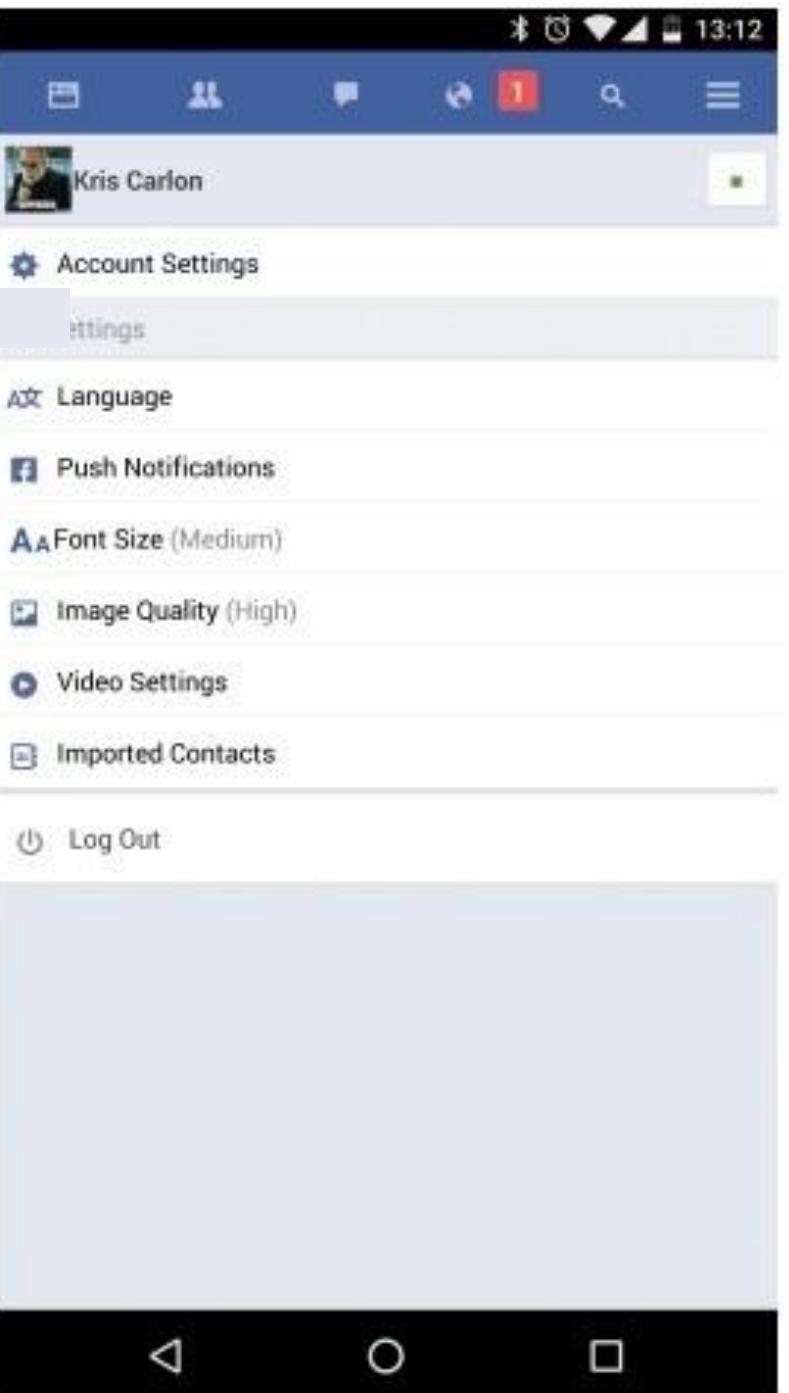
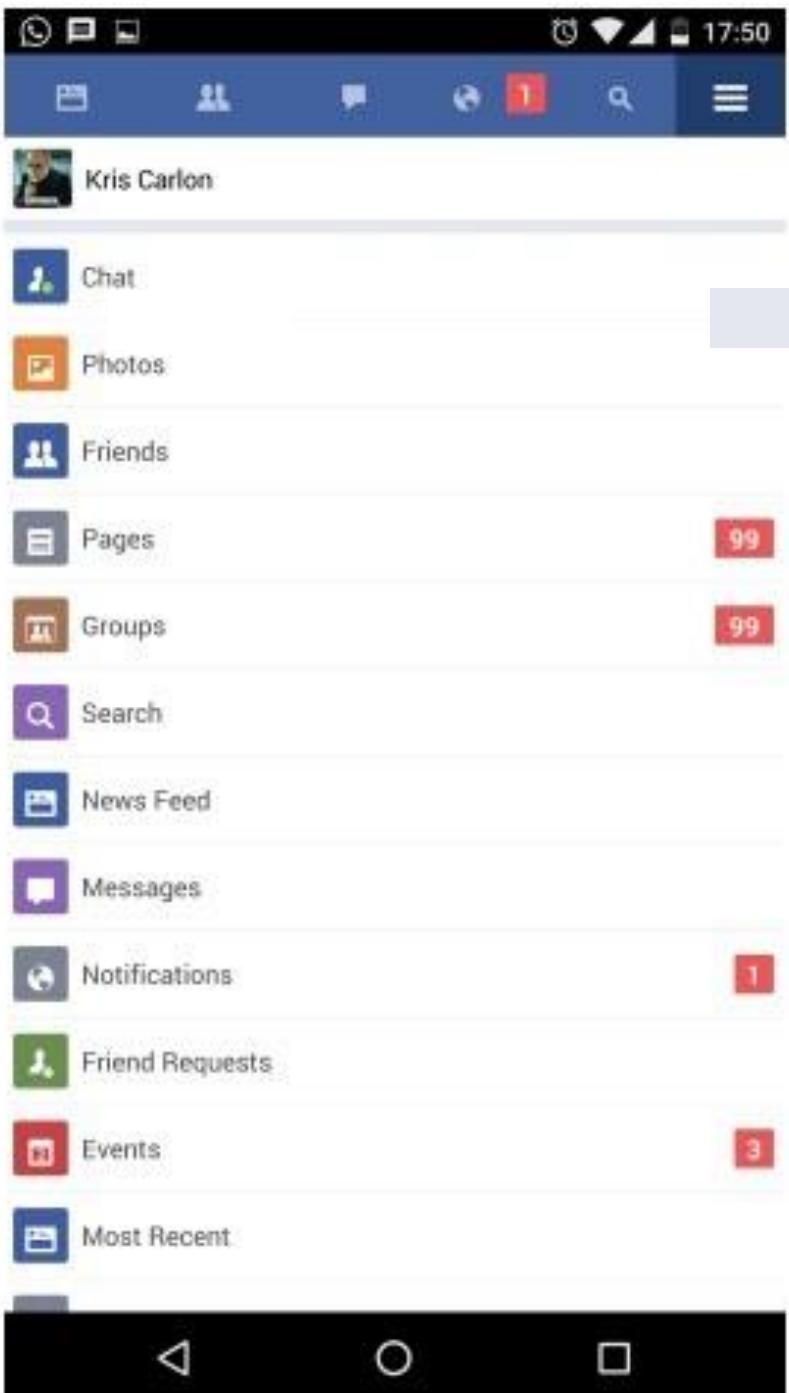
1,695

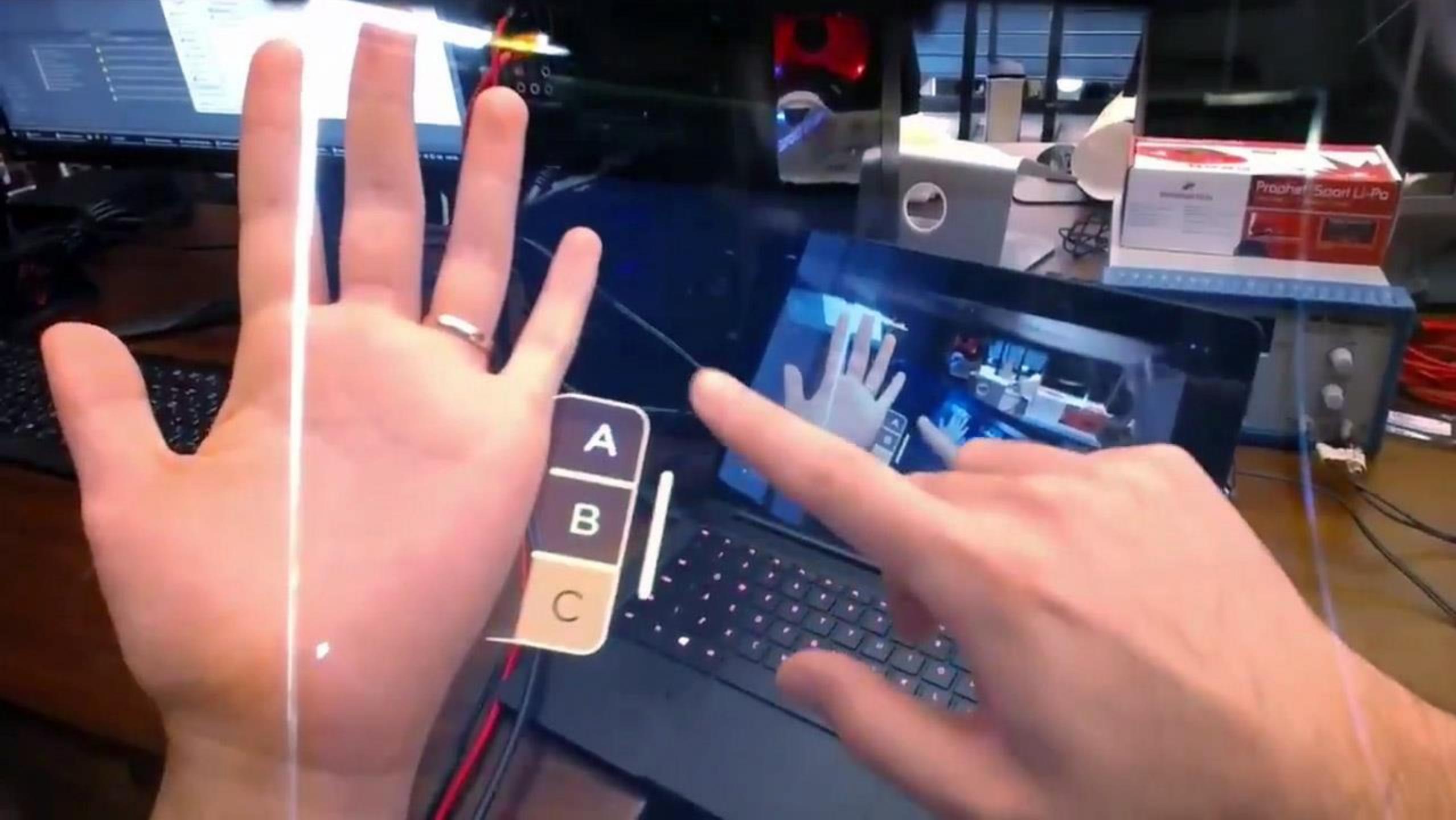


12:07 AM

24









HOME

12:45 PM



Ryan Northway

FAVORITES

WHAT'S NEW

RECENTLY PLAYED



HeroBound



Airmech VR



EVE: Valkyrie



VR Sports



Chronos



Edge of Nowhere



Lucky's Tale

FRIENDS



Joshua Harris
Oculus Cinema 1 min



Jon Malkemus
EVE: Valkyrie 5 min



Sanghee Oh
Herobound 6 min



Kristoffer Brady
Edge of Nowhere 10 min

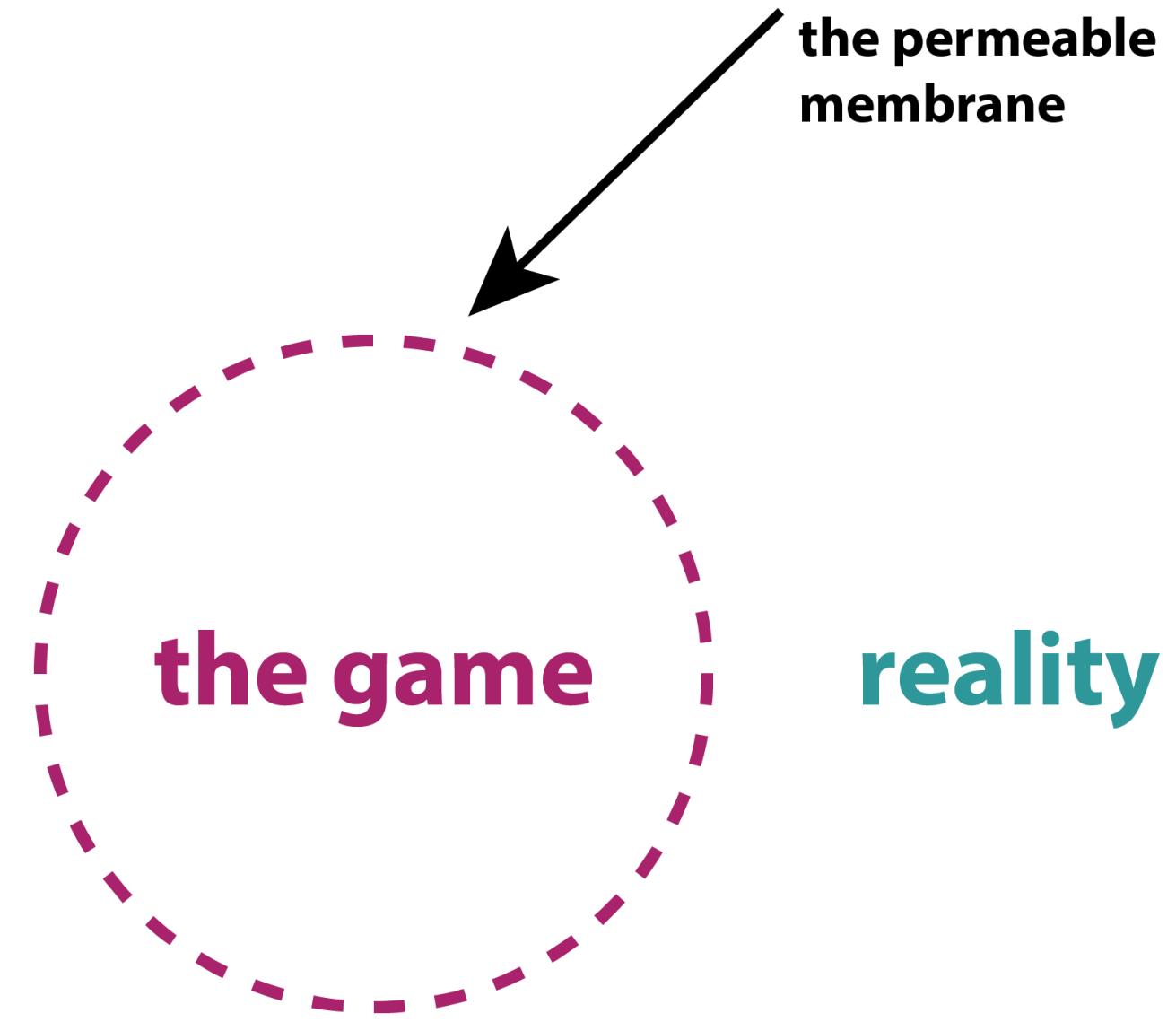


Soh Tanaka
Lucky's Tale 2 hr

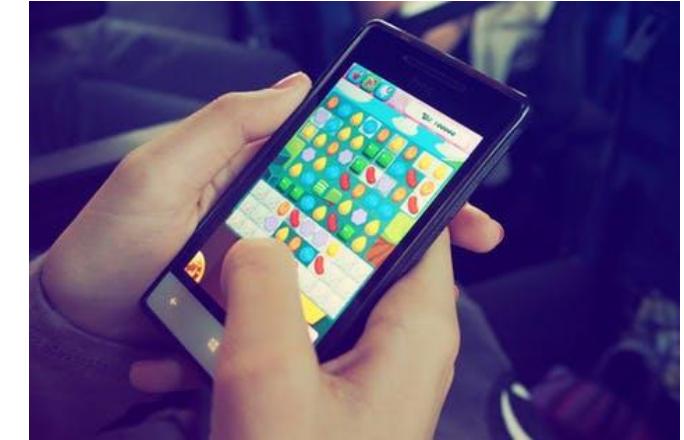


WHAT IS A GAME? |

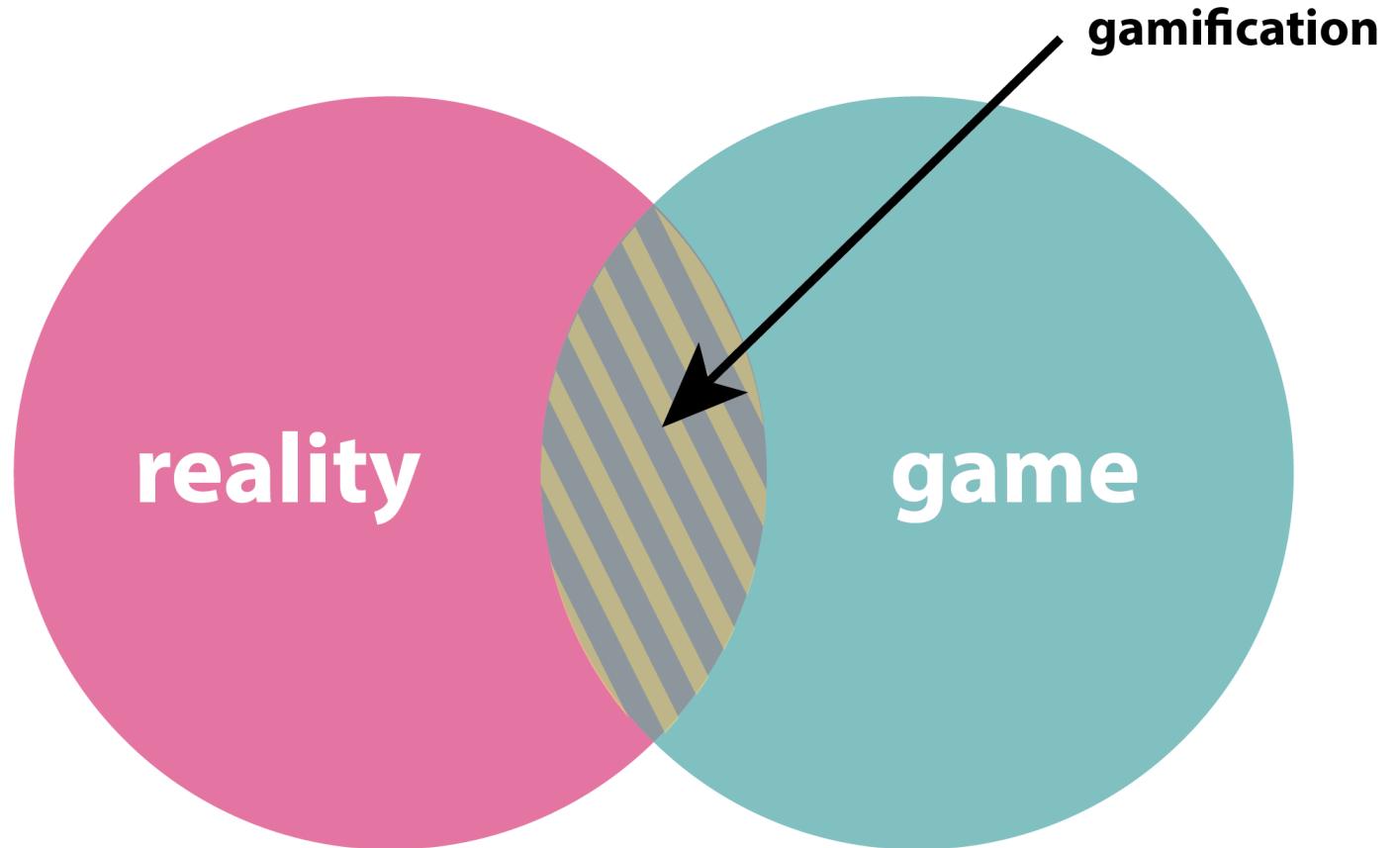
THE MAGIC CIRCLE



TYPES OF GAMES



GAMIFICATION



WHAT IS GAME DESIGN?





PLAYERS |

PLAYER MODELLING



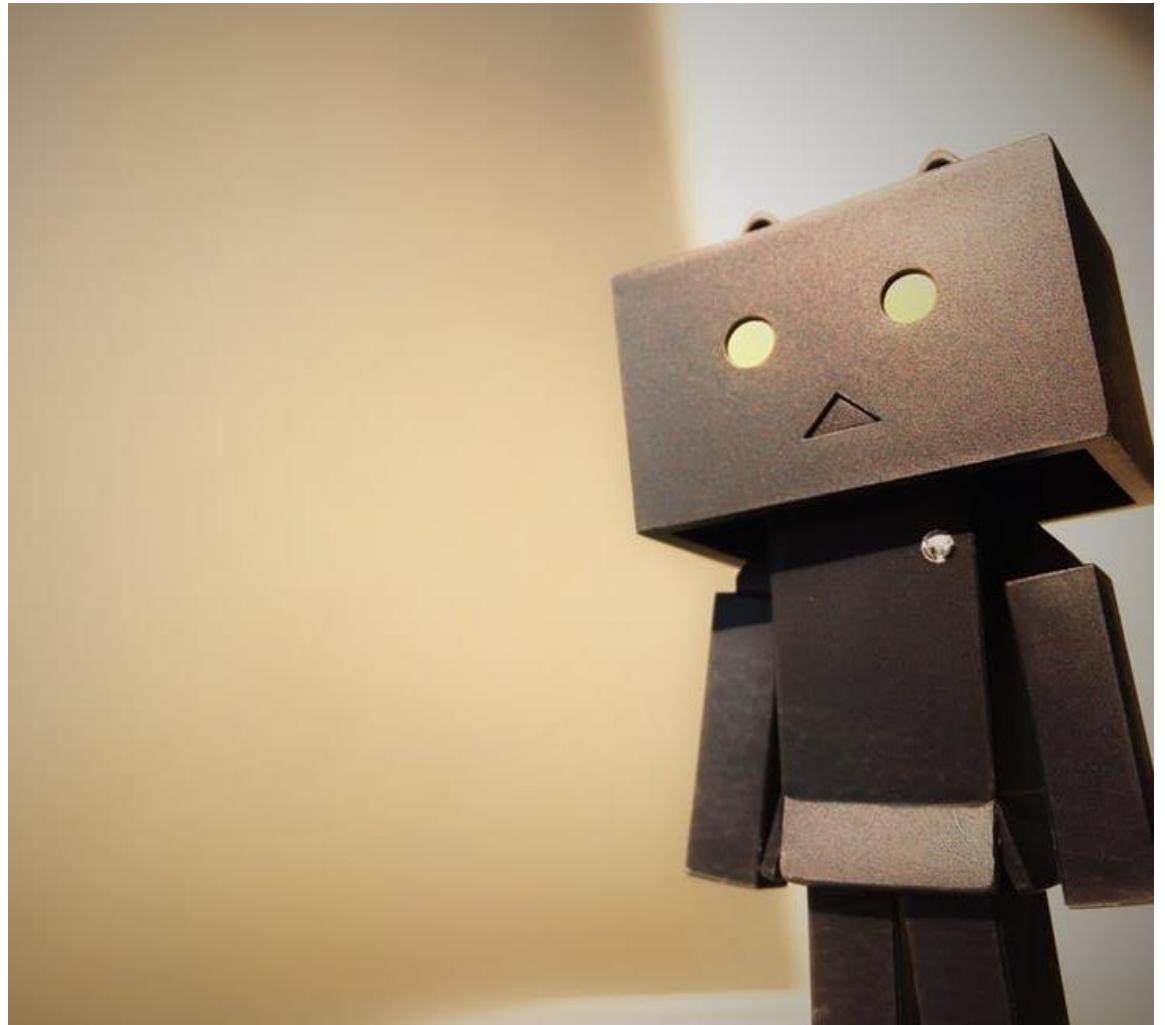
WHAT IS PLAYER MODELLING?

It is the study of modeling a players' cognitive, behavioral, and affective states.

These states are based on data (or theories), which are derived from the interaction of a (human) player with a game or game-like experience (e.g. gamification, serious games, etc.).

Player models are built on dynamic and static information such as information obtained during game-player interaction or player profiling information.

Different approaches and thoughts about the definition of what player modelling actually is.



Scope	Purpose	Domain	Source
<p>Individual <i>applicable only to one player</i></p> <p>Class <i>applicable to a sub-population</i></p> <p>Universal <i>applicable to all players</i></p> <p>Hypothetical <i>unlikely to be applicable to any players, but interesting nonetheless</i></p>	<p>Generative <i>literally produces details in place of a human player</i></p> <p>Descriptive <i>conveys a high-level description, usually visually or linguistically</i></p>	<p>Game Actions <i>details recorded inside of the game's rule system</i></p> <p>Human Reactions <i>details observable in the player as a result of play</i></p>	<p>Induced <i>learned/fit/recorded by algorithmic means</i></p> <p>Interpreted <i>concluded via fuzzy/subjective reasoning from records</i></p> <p>Analytic <i>derived purely from the game's rules and related models</i></p> <p>Synthetic <i>justified by reference to an internal belief or external theory</i></p>

PLAYER MODELLING TAXONOMY (SMITH ET. AL)

Smith, A.M., Lewis, C., Hullett, K., Smith, G., Sullivan, A., 2011. An inclusive taxonomy of player modeling. University of California, Santa Cruz, Tech. Rep. UCSC-SOE-11-13.

SCOPE

The process can focus on one, a subset or all players of a given game.



PURPOSE

Player modelling often aims either to replace the player in some fashion, or to generate information (linguistic descriptions) of the game itself.



DOMAIN

Are we modelling the actions in the game, or the players reactions to in-game activity?



Source

How is the player modelling achieved with respect to the data accrued? It's important to acknowledge that this can distinguish between models that capture directly from recorded data to achieve/replicate a human effect, versus those where more abstract knowledge is hoping to be gained that is not coupled directly to in-game sequences .

PLAYER MODELLING

18+ DIFFERENT MODELS AND FRAMEWORKS

Bartle – Player Types

Yee - Player Motivations in World of Warcraft

Ferro – The GEM Framework

Marczewski and Tondello – The Gamification User Types Hexad

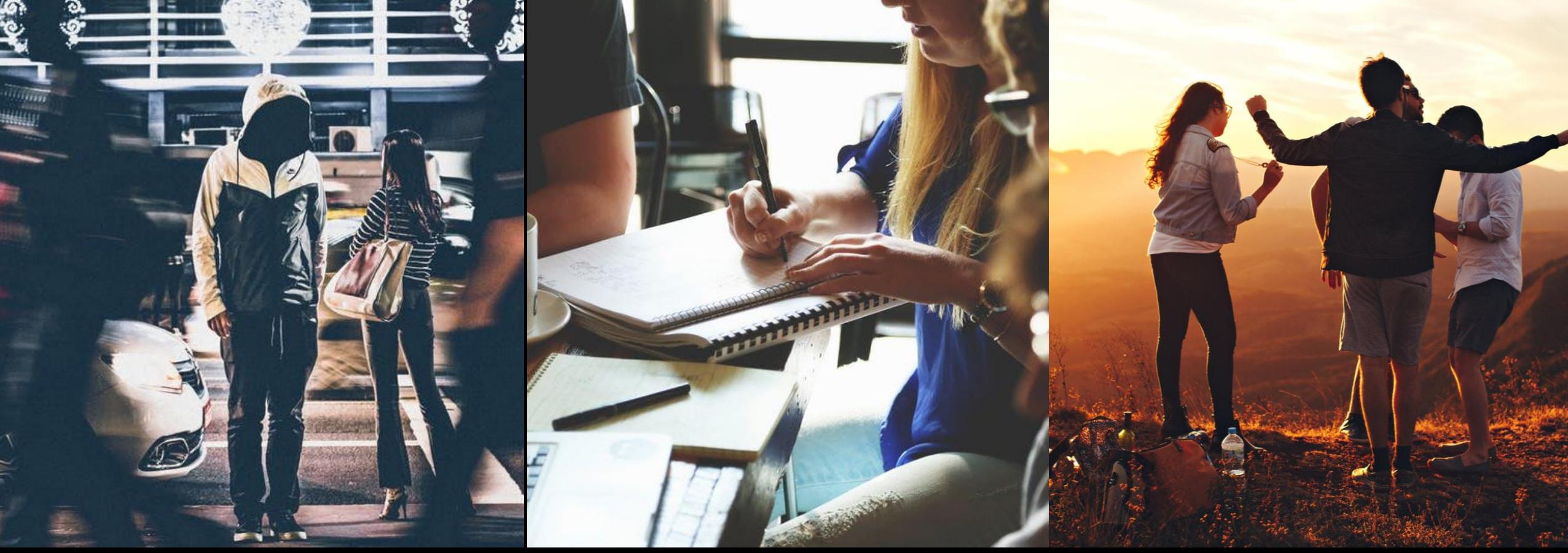
Nacke et. al – BrainHex

Chou – Octalysis Framework

Bateman and Boon – “Demographic game design” (DGD1) Model



PROFILING



Player profiling is a subcategory of player modelling that focuses on information that is not game specific and remains static over longer periods of time.

Examples of data typically included in a player profile would be personality, cultural background, gender, and age.

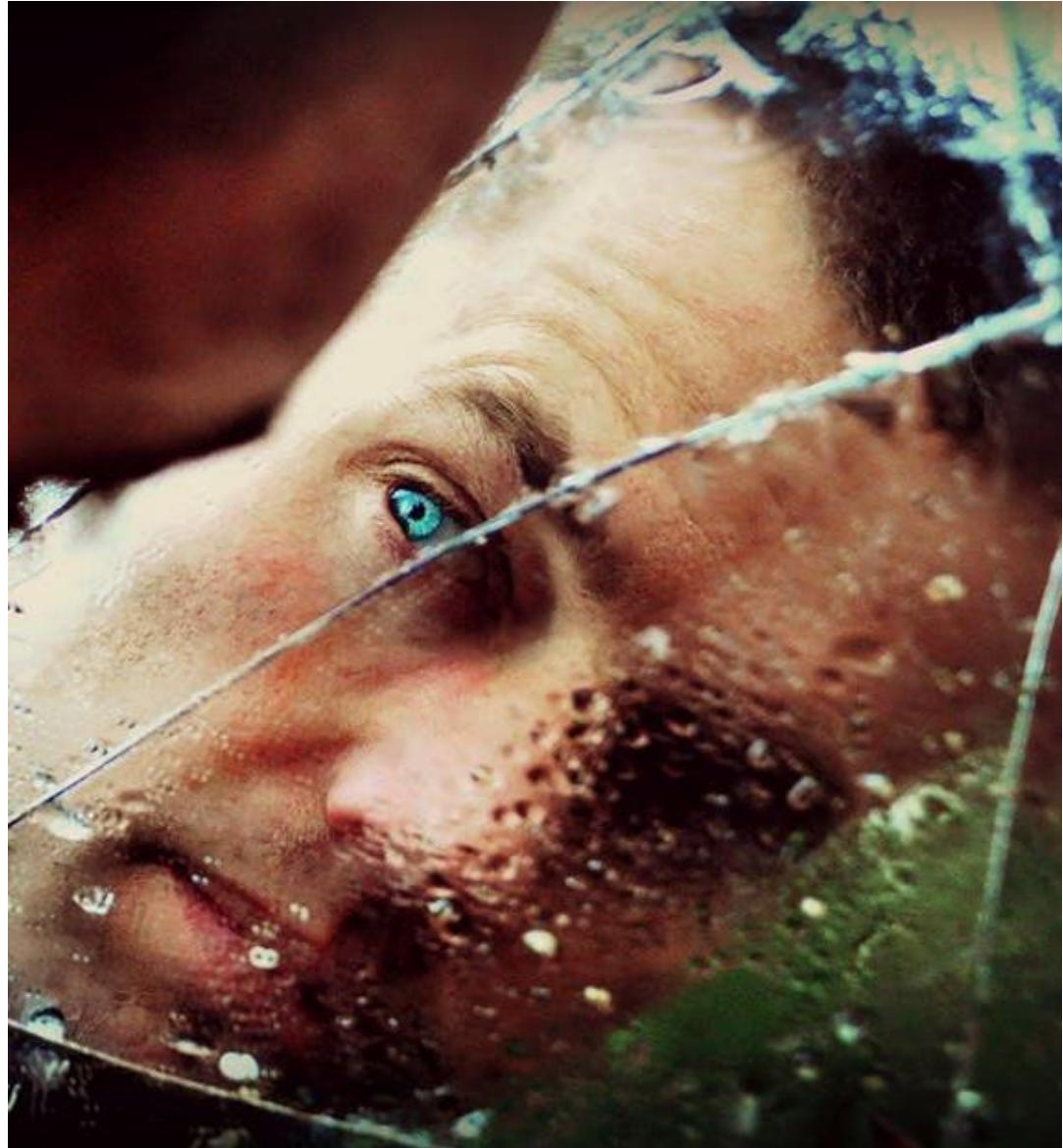


APPROACHES TO PLAYER PROFILING |

STEREOTYPING



PSYCHOLOGY, PSYCHOMETRICS, ETC.



PROFILING VS. MODELLING

Profiling	Modelling
Defines the audience	Groups the audience
Lemon, citrus, sweet...etc.	Fruit
Competitive, dominant, assertive	Killer (player type)

ARTIFICIAL
INTELLIGENCE

```
    'replace_interests' => false,  
    'send_welcome'      => false,  
    ...  
  
    if(result['error'], result)) {  
        result = array('response'=>'error', 'message'  
    }  
    result = array('response'=>'success');  
  
    send(result);
```

PERSONAS



THE POINT OF PERSONAS

A (usually informed) representation of your target audience.

Numerous research data for product design are quite difficult to handle, especially when we need to pay attention to the data throughout the entire process. Therefore, Persona will be a relatively more realistic and concrete object, although not a real person, it is the most typical image of many real Personas. And it can remind us of the users' needs and help us make a better user experience model because of which real users will feel more comfortable while using product. This is why it can facilitate the development.

Two Types: design and market

Value of a persona



WHO IS SHE?

WHAT IS SHE?

How would you describe her?

Is she educated?

What kind of work does she do?

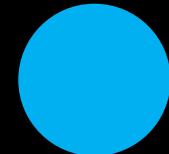
How does she interact with other people?



Does she reflect the
customer base?

Is she in/out of the
target age

How much does she
earn a year?



We need more information!



MAFALDA

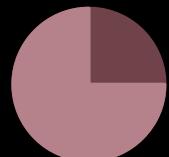
SMART SHOPPER

Tech savvy, spontaneous,
confident, knowledgeable

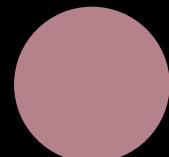
Has a bachelors degree

Previously worked as a freelance designer

Uses social media as a way to keep in-touch and
up-to-date



Percentage of
customer base



Target age



Target salary range

Mafalda is 29, married with no children. She works full time as
an assistant manager and lives in Rome.



ADAPTIVITY



TYPES OF ADAPTIVITY

Difficulty (DDA)

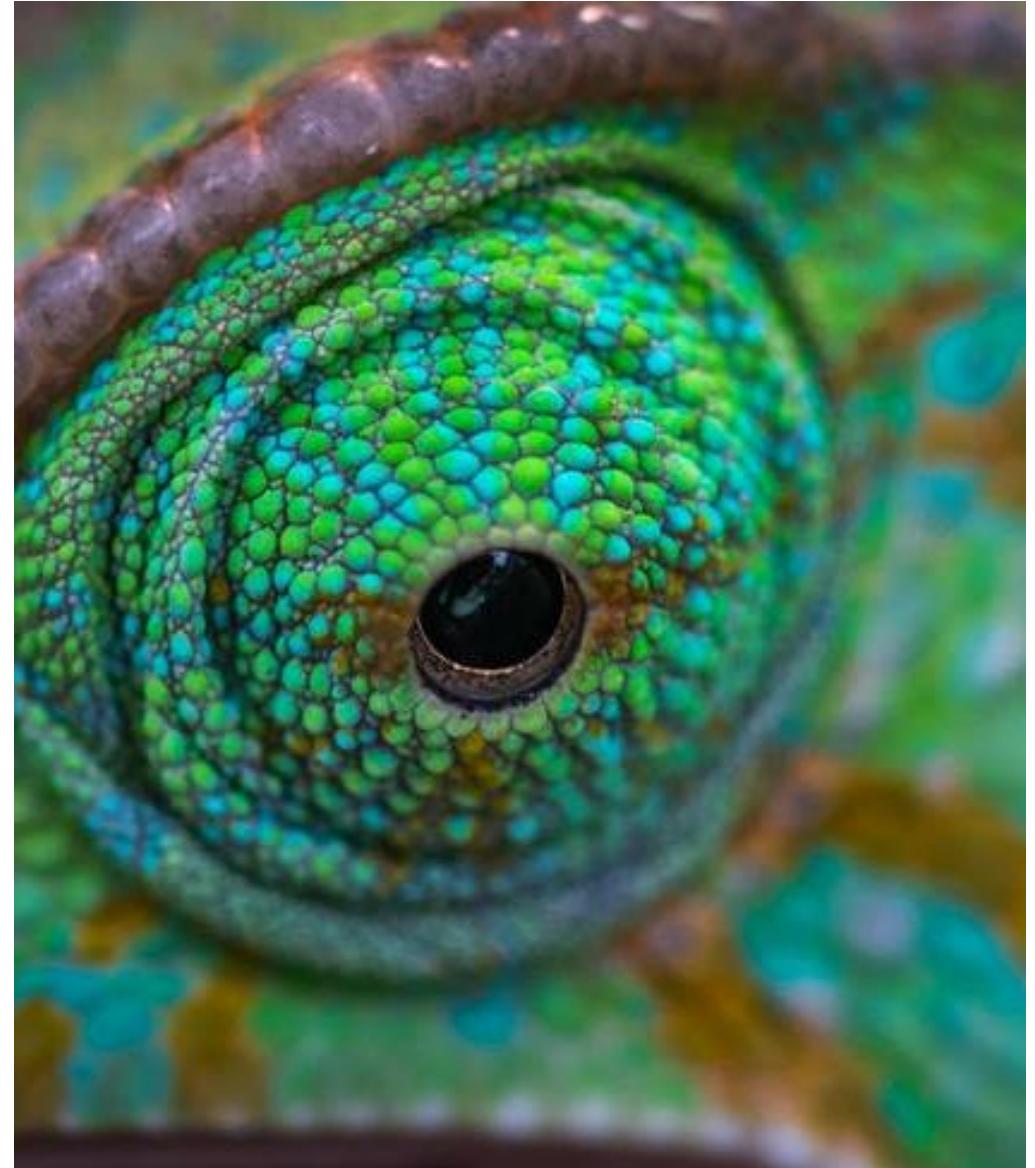
Environmental

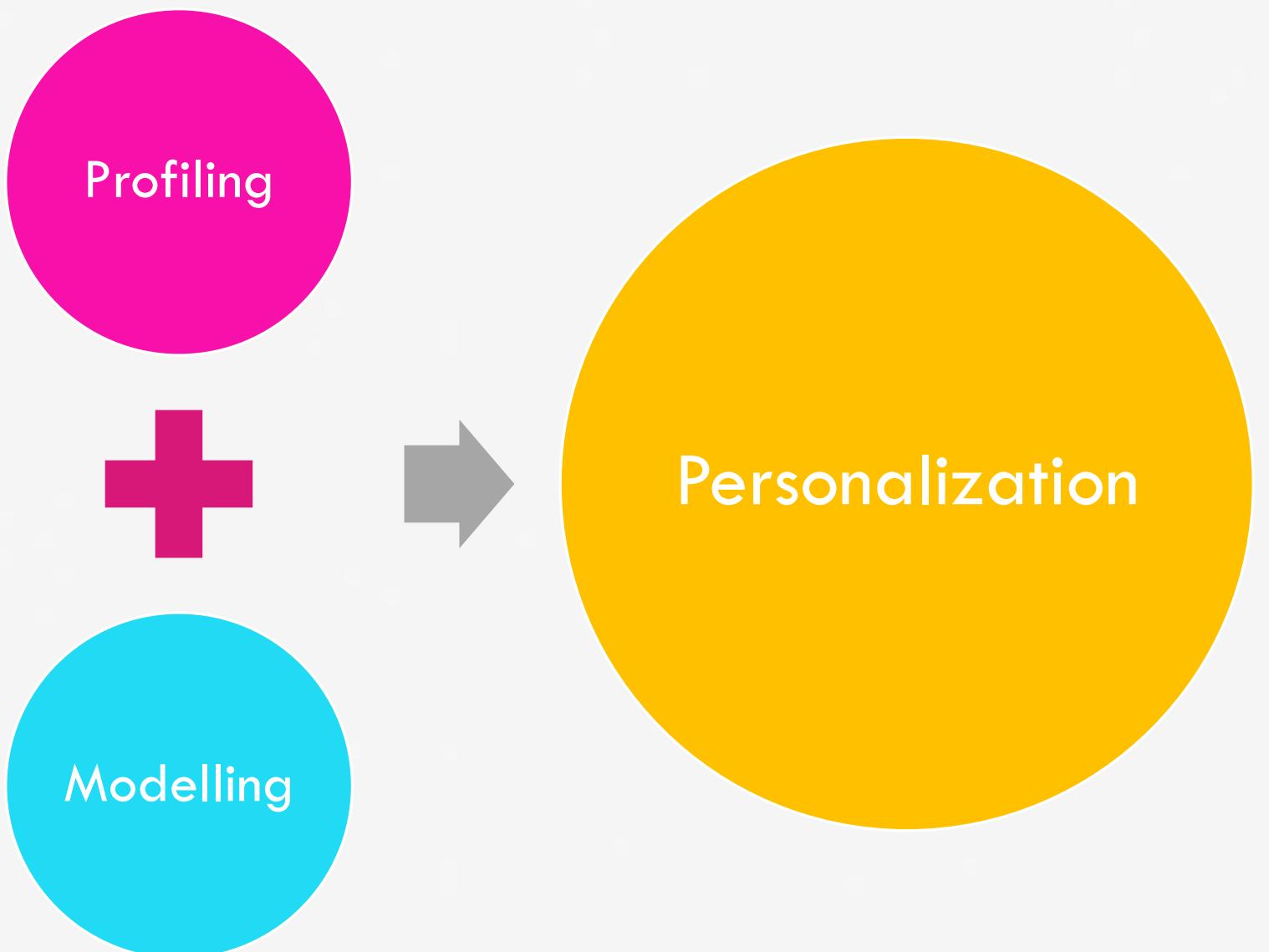
Aural (music based on
combat/interaction with NPCs)

Artificial Intelligence

Game balancing

Level of Detail (LOD)





PERSONALIZATION



PERSONALIZATION AND CUSTOMIZATION

Essentially player modelling and profiling is intended to provide a more **personalized** experience for a systems audience.

Creating a (game) system that is **meaningful**

Giving players options to modify their environment and experience the way that *they like it*

Adaptation based on profile/model information





PERSONALIZATION - EXAMPLES

Cultural

Language

Avatar (think The Sims)

Customization - examples

- Different skills
- Displaying/Hiding various game elements
- Player classes

The easiest way to remember is that personalization is like the paint job on a custom car, while customization is the parts under the hood

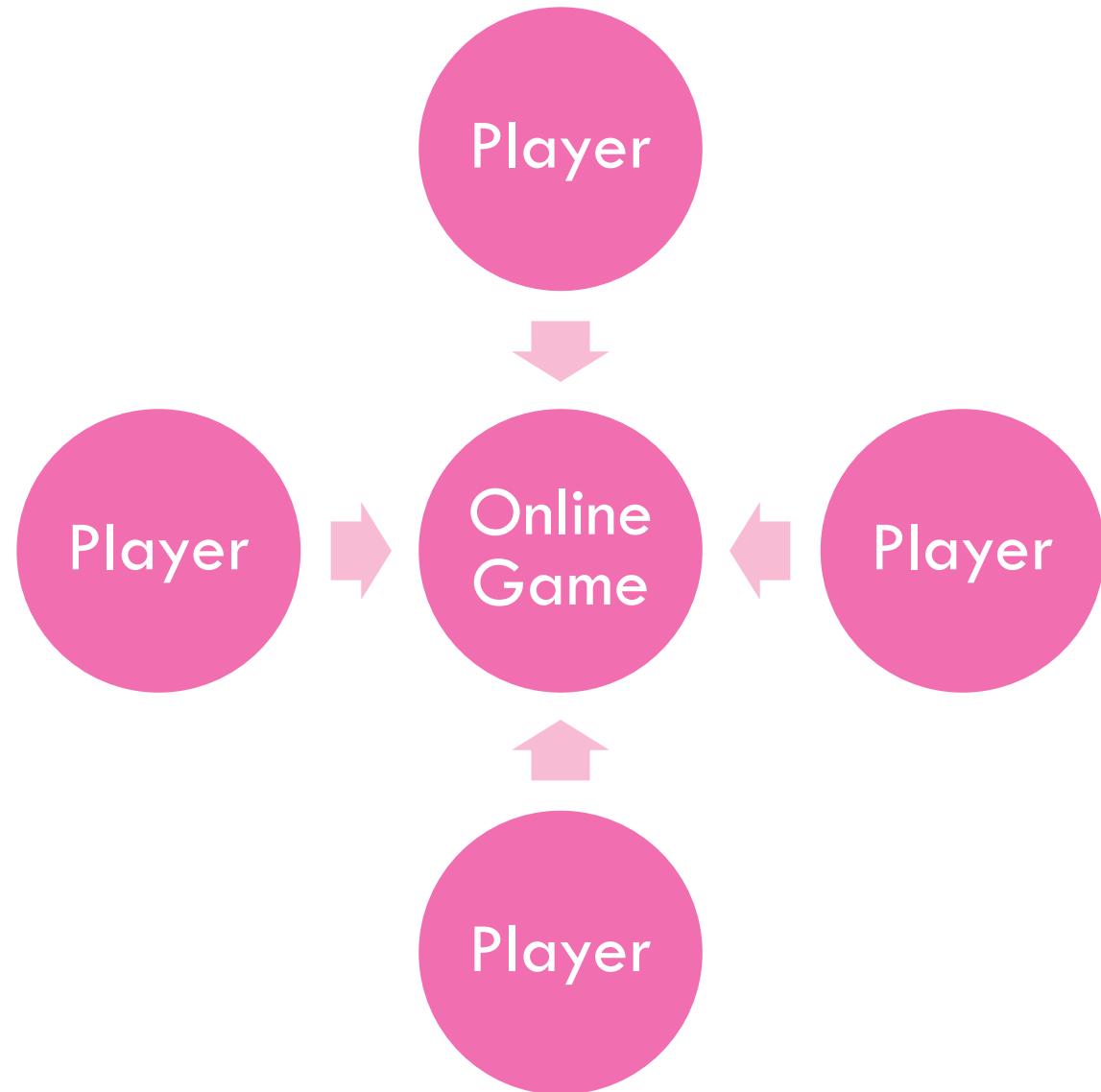
ONLINE GAMING





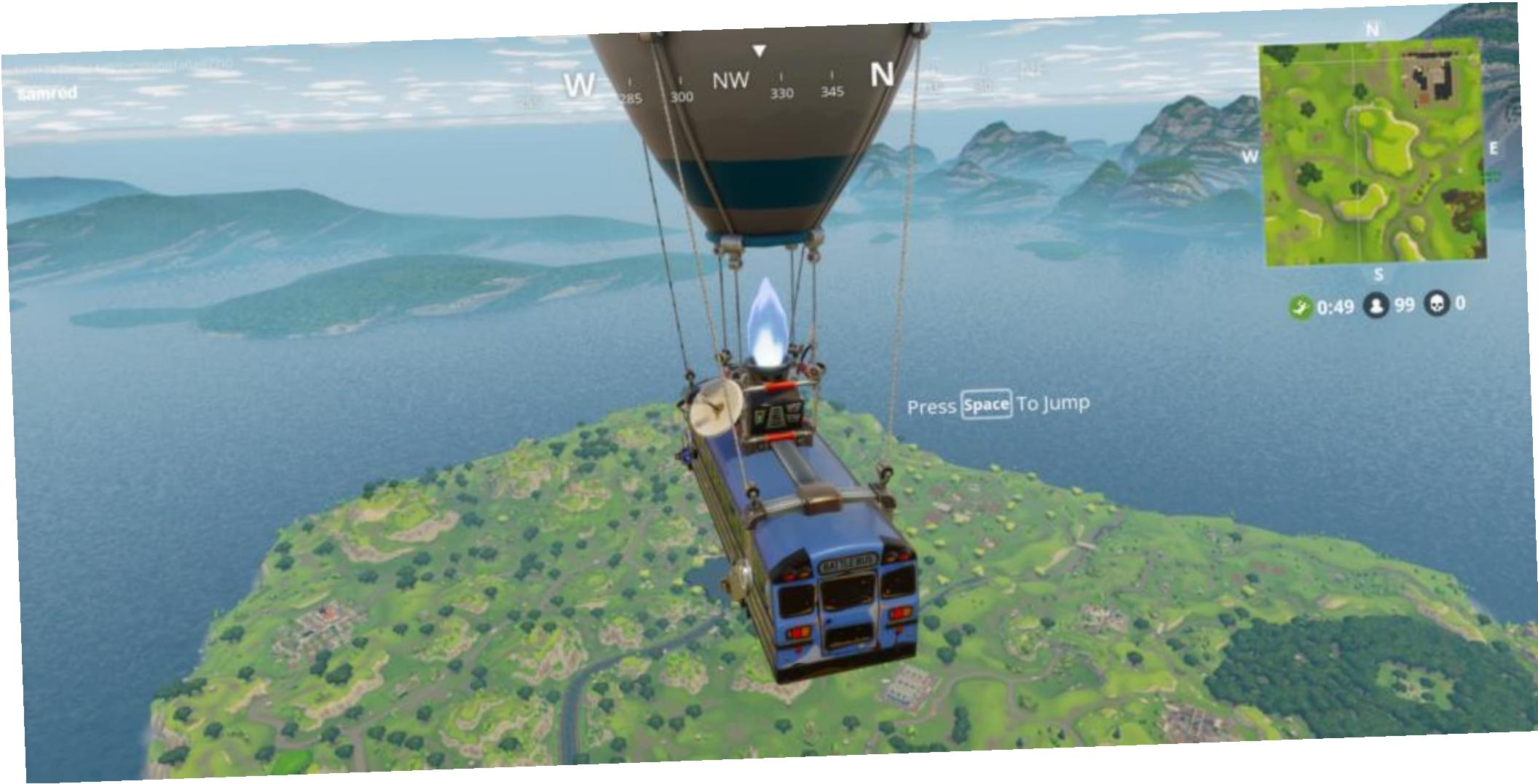
MMO, MMORPG, MMOFPS,
MOBA, ETC.





FORTNITE





Enricofairme69
e8b74d51d1cb416f930a347bdd511a67

Enricofairme69



The storm reduces the playable area

and over time players converge.

Game Info

0:50 14 0

Map Info

- Zoom
- Place Marker
- Remove Marker



FORTNITE

3



Battle Royale

LOBBY

LEADERBOARDS

STATS

[Epic] Frost
Not Ready



DarkVeil
Ready



spinalfluid
Not Ready



RZE
Not Ready



[2:56 PM] Party: [Epic] Frost left the party.
[2:56 PM] Party: [Epic] Frost joined the party.

Match Type

Squad

Squad Fill

Fill

Ready



EVE®
ONLINE

Selected Item
No Object Selected



EVE
UNIVERSITY

MODERATING AND BANNING





PLAYER BEHAVIOR

We (Riot Games) design diverse systems using three core philosophies based on reform, punishment, and reward (in League of Legends).



iP nuke: I hope

iP nuke: you

mamboox joined the room.

Grand Marshal joined the room.

Prince Discharge: BRONZE V

Prince Discharge: omg

get cancer and die

IGLODYTAM joined the room.

think

/TM B1G Throws: gg kennen

/TM Rambooooooooo: LISSANDRA COL
MORNON

DAT LegendProx: YOU MORON ****

DAT AxeLote: RENGAR FEED YOU

DAT LegendProx: U LOSSER

DAT AxeLote: *****

DAT LegendProx: NOOB





Dunkey @vgdunkey · Sep 3
ranked

Player Banned

Due to toxic behavior in your recent matches, your account has been suspended for 14 days. Please check your e-mail for detailed feedback about your punishment.

[Close](#)



338

1.3K

...



Thank you!

You've earned a mystery gift from Riot Games

Warring Kingdoms Jarvan IV

By rejecting negative behavior and staying positive in the heat of battle, you're the best kind of League player. Enjoy this free mystery gift as our thanks to you for being a positive example for the community!

Awesome!

COMMUNITY CREATIONS

Liquid Peter



AriesKG

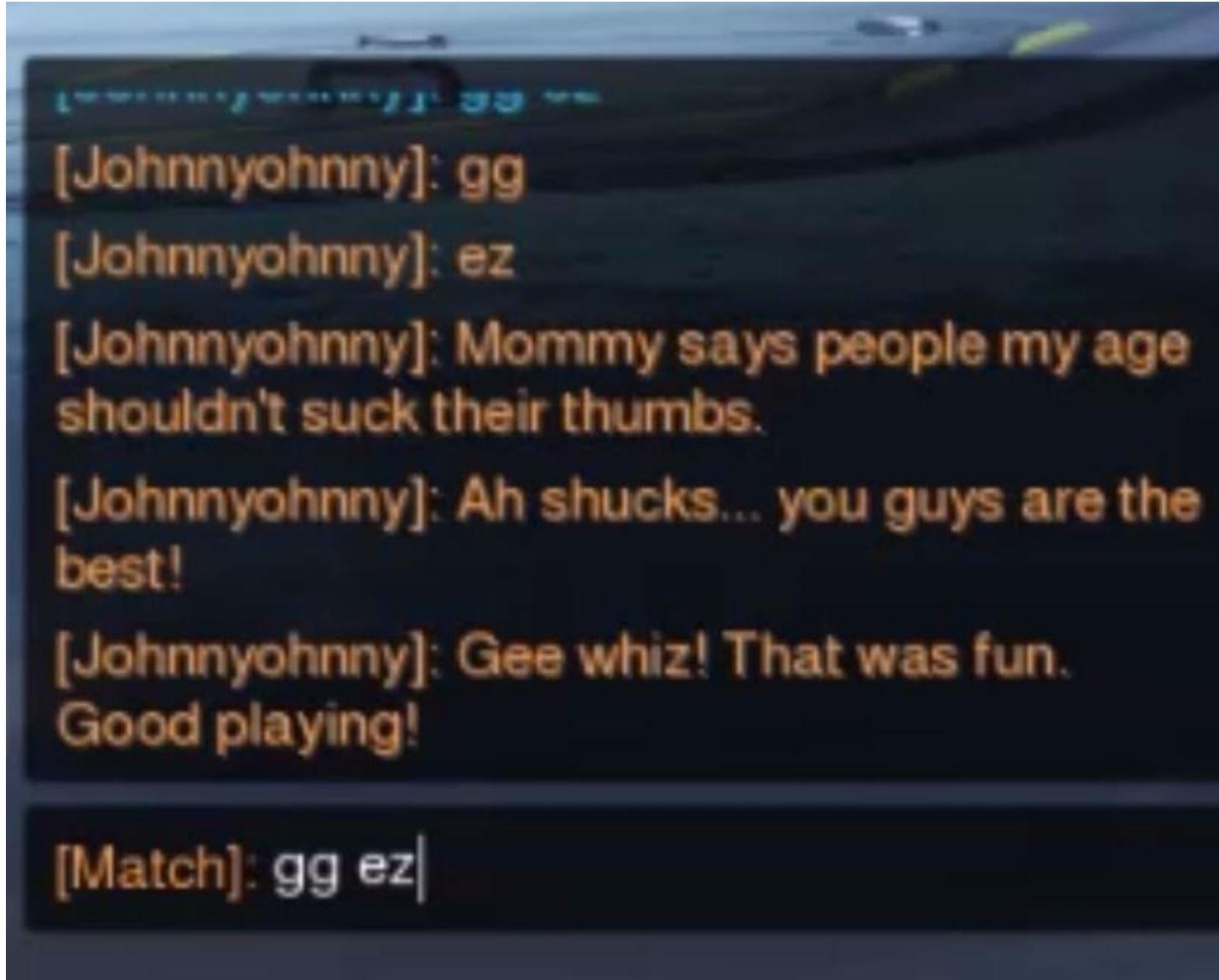


K3lithie



**IN RESPONSE
TO
“GG EZ”**

**GOOD GAME,
EASY WIN**





KEEP
CALM
AND
DRINK
COFFEE

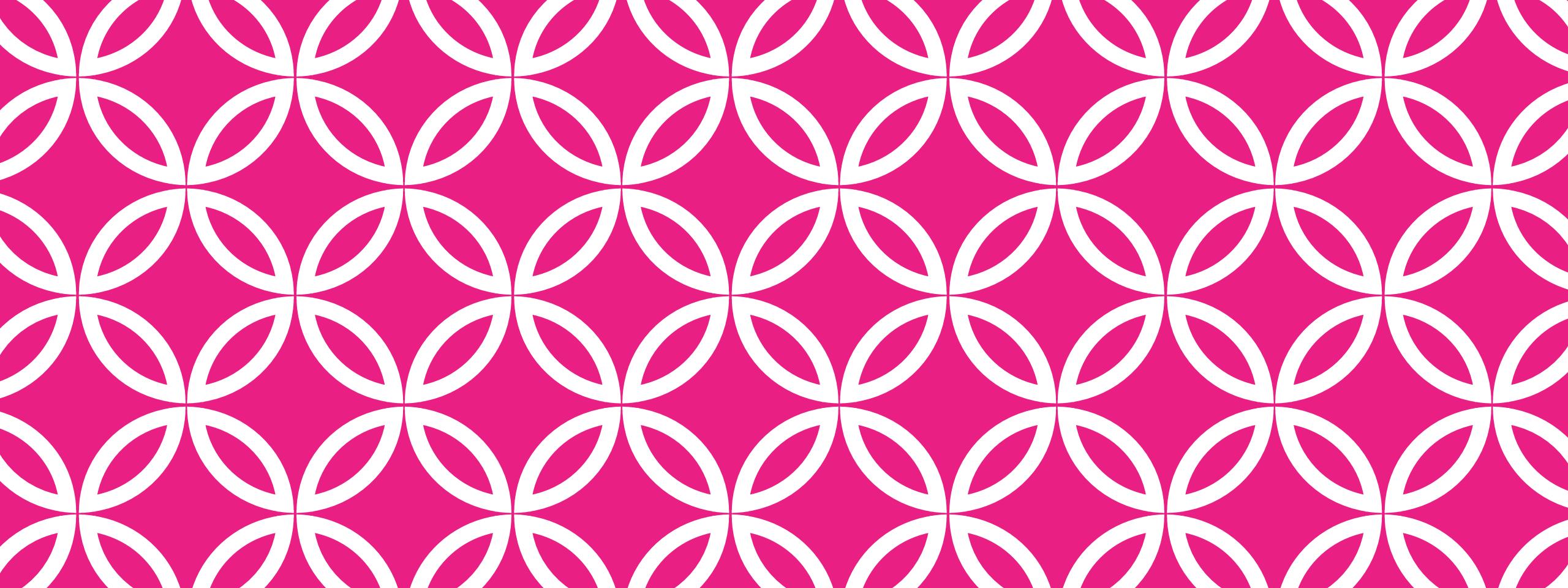


UNREAL ENGINE • ROME, IT

@UEMeetupRome

facebook.com/UEMeetupRome

tinyurl.com/UEMeetupRome



THANK-YOU

Dr. Lauren S. Ferro Ph.D

LSFERRO@diag.uniroma1.it
@R3nza