



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

BA COMPUTER GAMES DESIGN

GAME THEORY & DESIGN

Game Prototyping: Part 1



- Definition of game prototype

- Physical Prototypes

- Building a Physical prototype
- Visualising core gameplay

- Software prototypes

- Prototyping Exercise





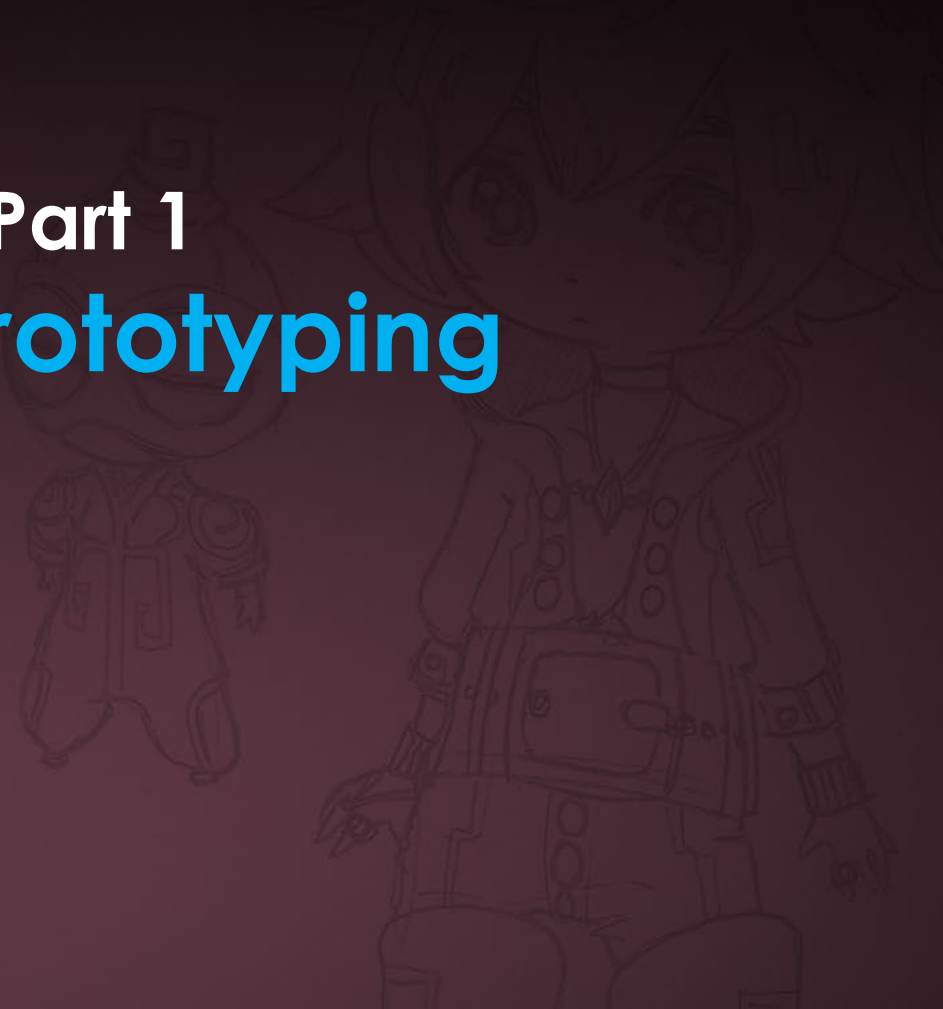
Game Prototyping: Part 1

Definition of Game Prototyping



normal job in
crazy ass world.

fixed position
- talking to
npc's





“Prototyping lies at the heart of good game design.”

The word “prototyping” means to **create a working version** of the formal system that, while playable, includes only a **rough approximation of the artwork, sound and features**.

Think of it as a crude model whose purpose is to allow you to wrap your brain around the game mechanics and see how they function.”

(Fullerton, Swain & Hoffman 2004:157)



“If you invest the time, you’ll discover that it teaches you about the essence of game design.

All you have are the fundamental mechanics to keep you engaged, and if these mechanics can sustain the interest of playtesters, you know that you’re onto something.

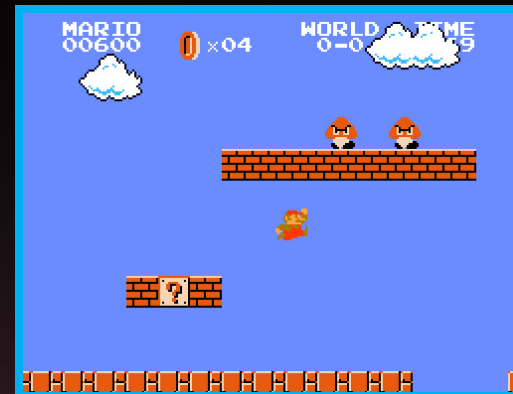
*The main advantage of prototyping is that **it forces you to define game mechanics in their purest form.**”*

(Fullerton, Swain & Hoffman 2004:157)



Look at many titles that are widely considered to be great games.

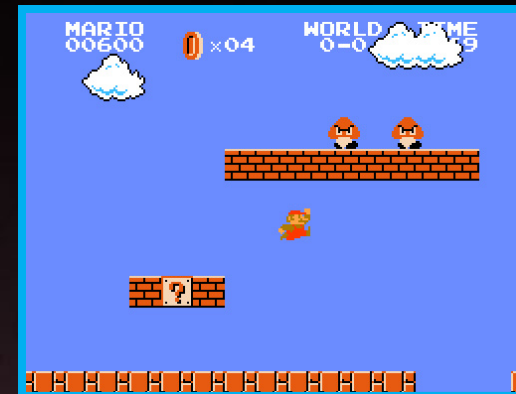
The core gameplay is usually not that complex.



(Fullerton, Swain & Hoffman 2004:157)



Games such as Nintendo's *Super Mario Bros.*, (1985) Westwood Studios' *Command and Conquer* (1995) and Bungie's *Halo* (2001) have relatively straightforward gameplay.

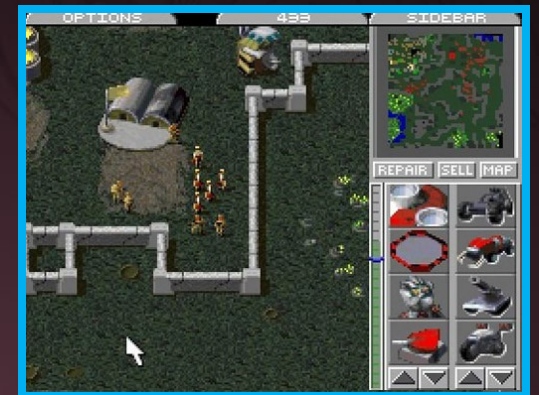
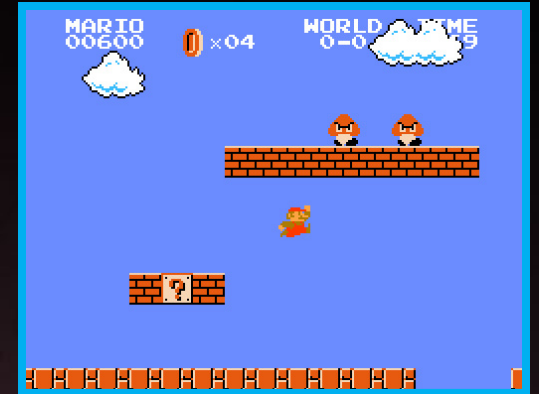


(Fullerton, Swain & Hoffman 2004:157)



Games such as Nintendo's *Super Mario Bros.*, (1985) Westwood Studios' *Command and Conquer* (1995) and Bungie's *Halo* (2001) have relatively straightforward gameplay.

These games are engaging largely because they are so easy to understand.



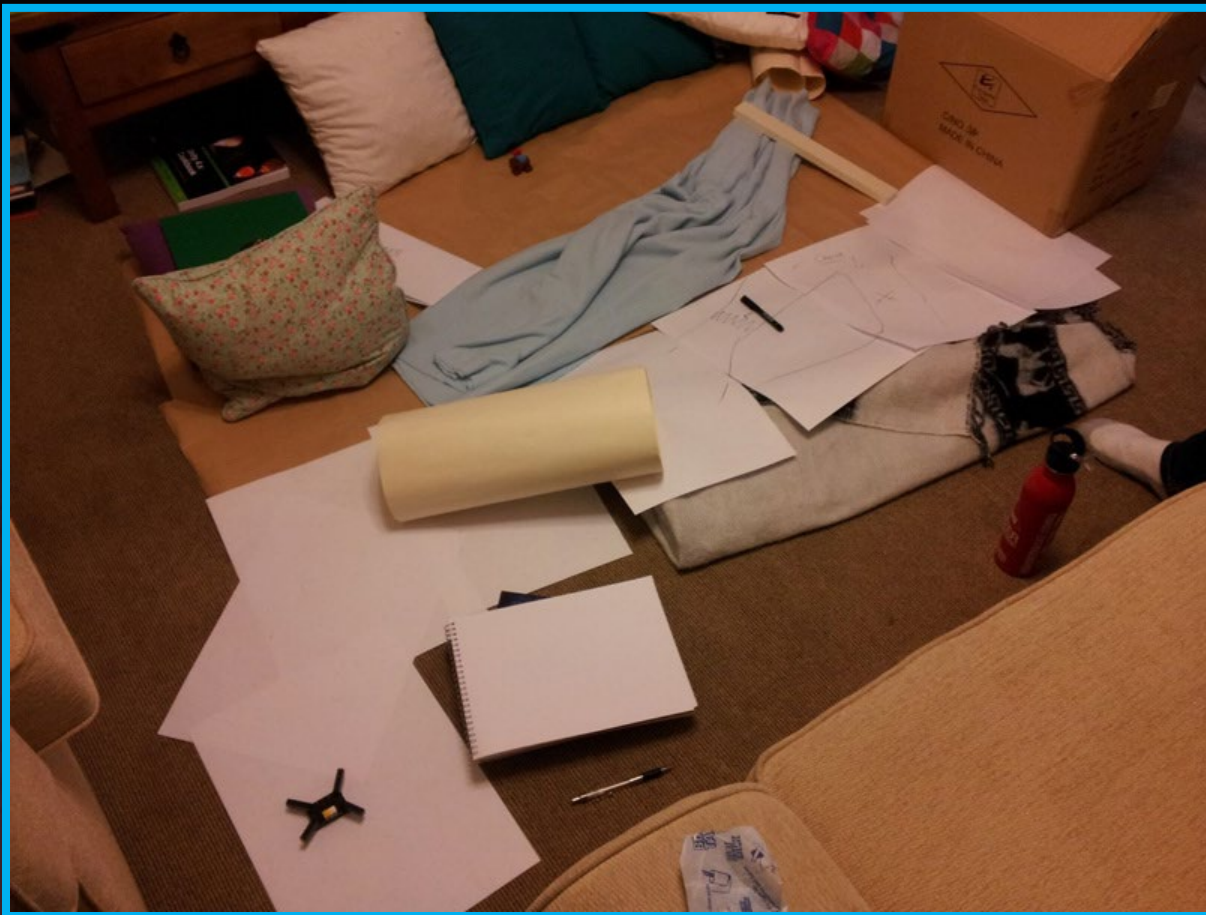
(Fullerton, Swain & Hoffman 2004:157)



GAME THEORY & DESIGN

Game Prototyping: Part 1

Definition of Game Prototyping

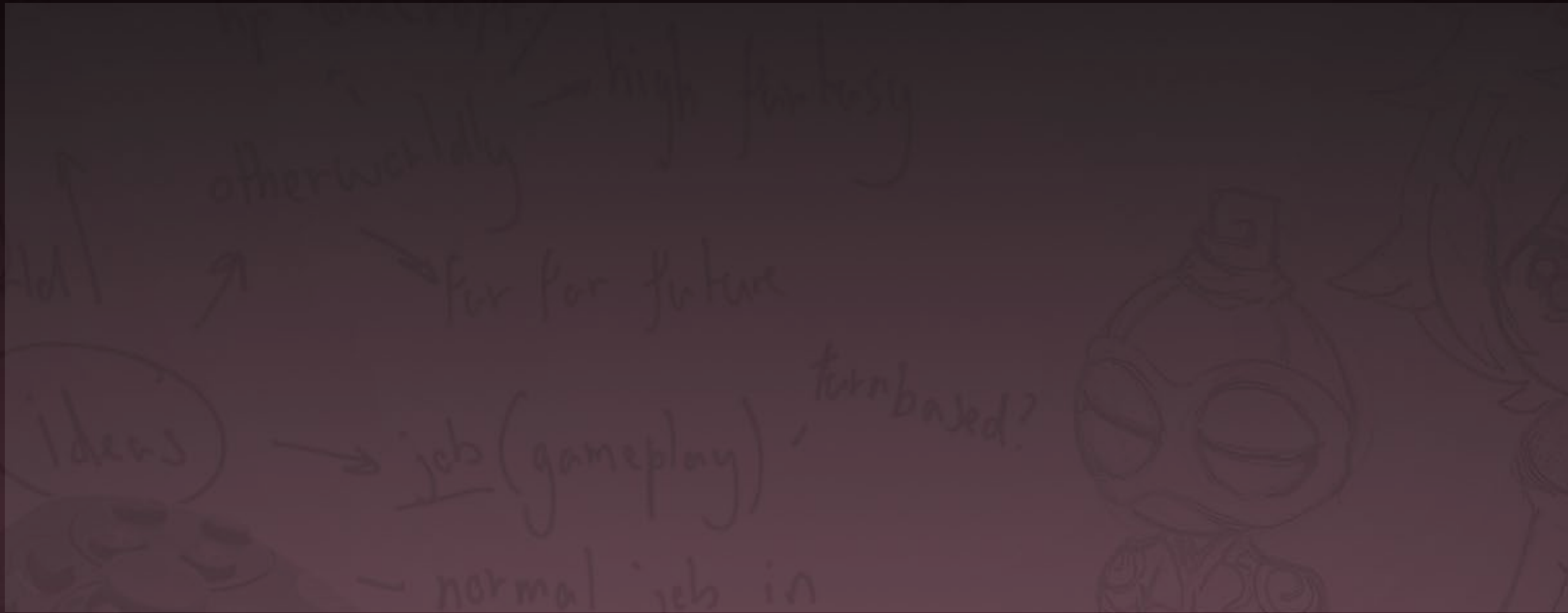


*“The prototyping **phase** gives developers a chance to test their ideas – to push and pull them to see where, if anywhere, they break.”*

(Thorn, 2014:21)



There are two types of prototypes:



The difference is that **physical prototypes** tend to be created using pen and paper or other real-world materials, while **software prototypes** are entirely digital and rely on computer code to function.

(Fullerton, Swain & Hoffman 2004:158)



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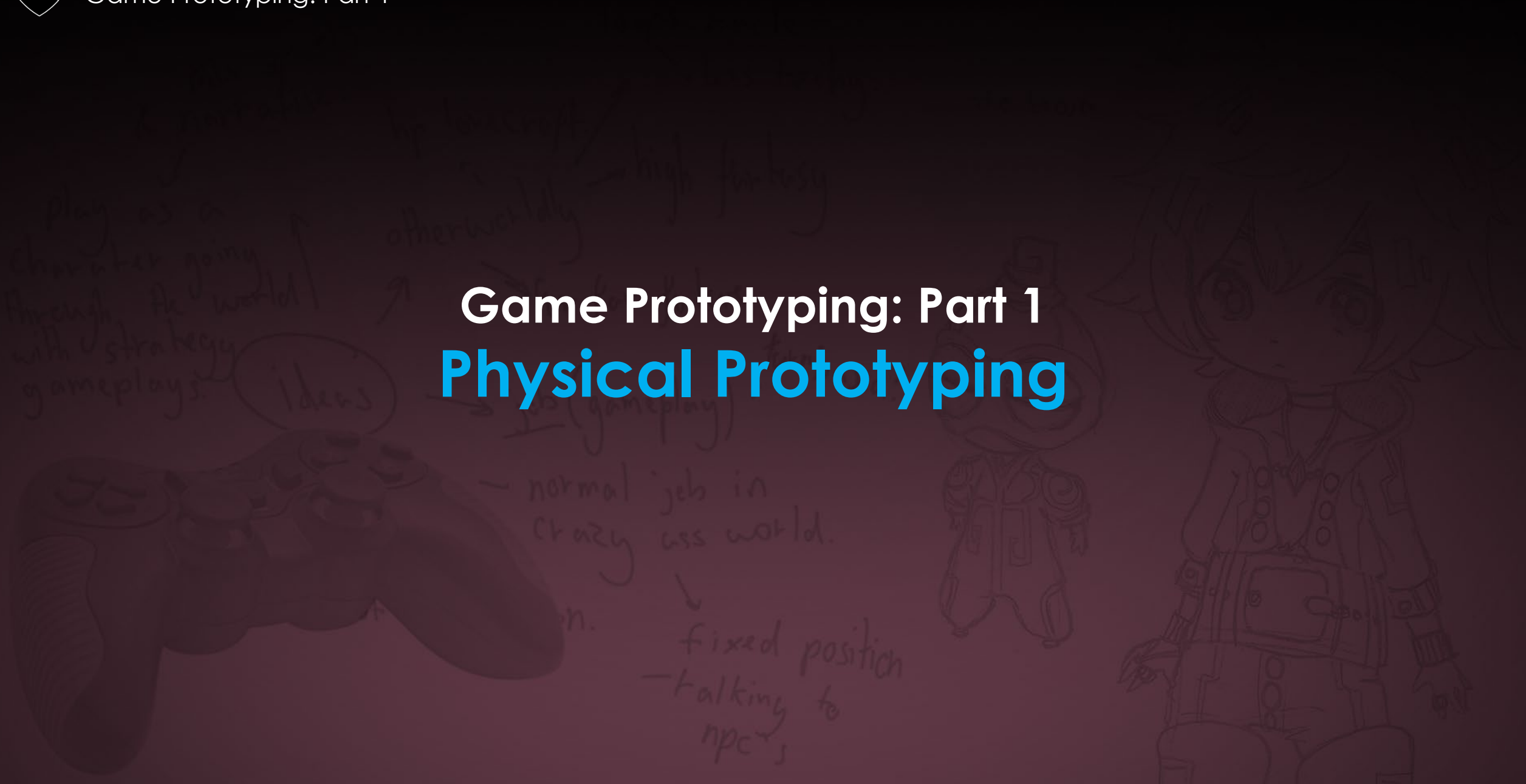
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Game Prototyping: Part 1

Physical Prototyping





Physical prototypes are typically created using slips of paper, cardboard, and household objects with hand-drawn markings.

Anything can be used, even toys or objects from other games.



The goal is to **rough out system components** so that you can see how the game operates on a mechanical level.

It may only be an approximation of the final product, but it serves its purpose - often **the limitations of pen and paper enable you to see the underlying forms and structures more clearly.**



Many designers take a shortcut, skipping the creation of a physical prototype altogether and jumping straight from dreaming up a concept to writing the design document.

The problem with this method is that the design document is completed and the software coding has commenced before anyone has a true sense for the game mechanics.



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How can someone design a game without understanding the core game structure?

(Fullerton, Swain & Hoffman, 2004:17)



This is the reason why so many games wind up looking and feeling like carbon copies of one another.

It is difficult to design an original game if you skip the physical prototyping process. The result of this is that the game designer is forced to **reference existing games** in the GDD.

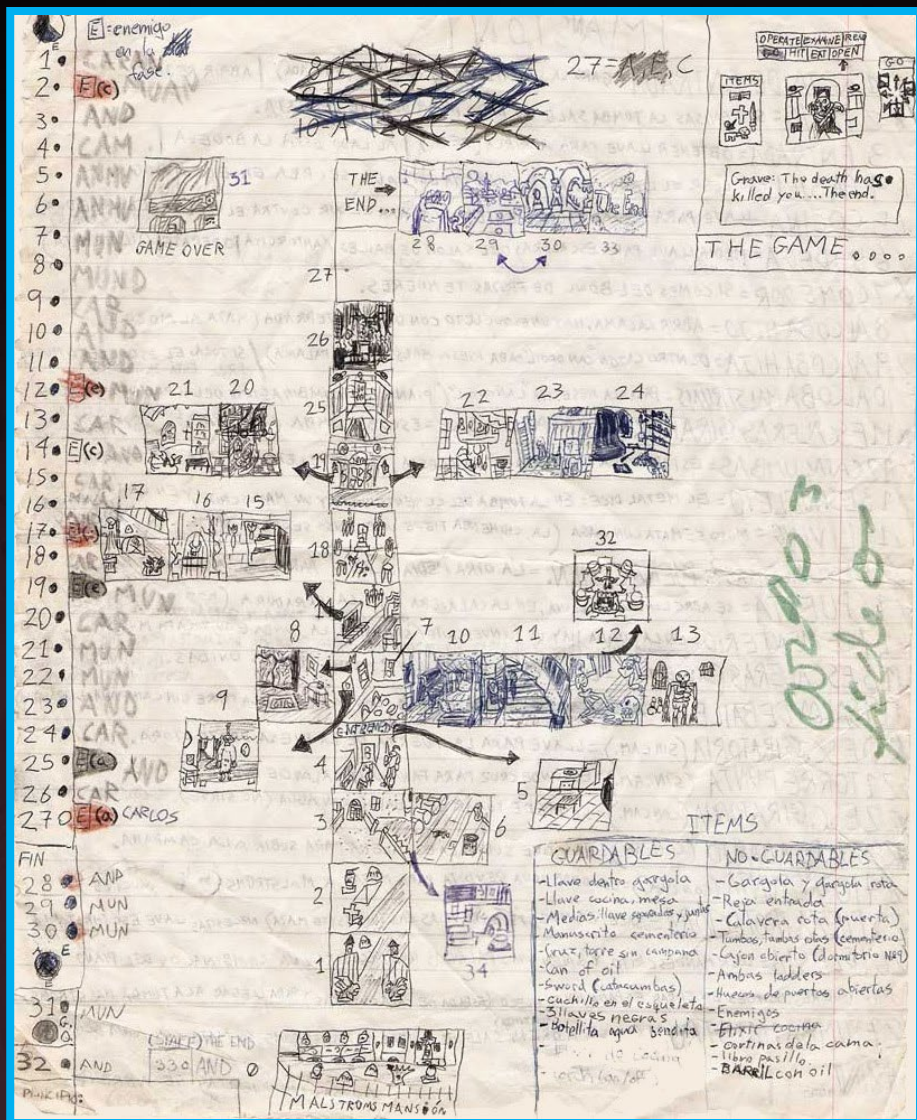
This means the game being created is **doomed to be derivative.**



GAME THEORY & DESIGN

Game Prototyping: Part 1

Physical Prototyping



It is much easier to make a change to a pen and paper model than to ask several programmers, who have spent a week or more coding the gameplay, to alter something.

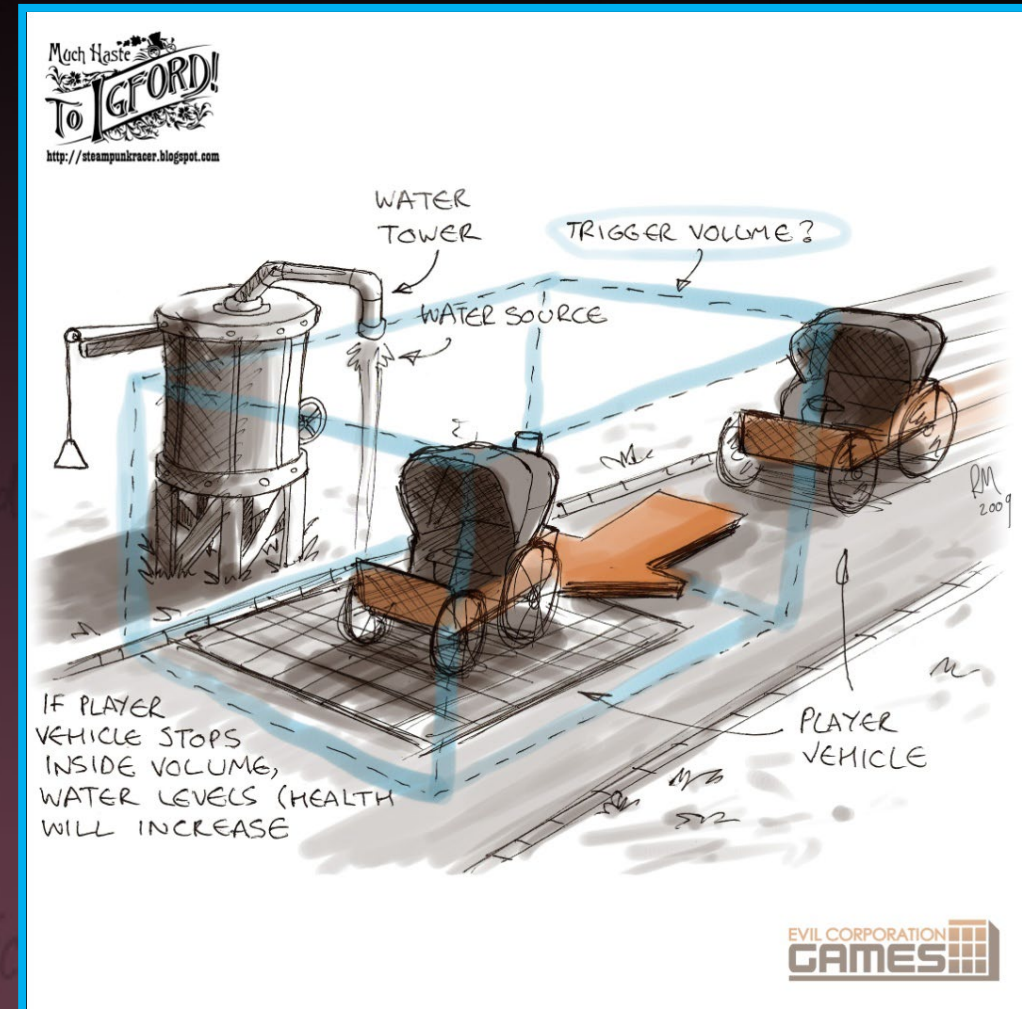
(Fullerton, Swain & Hoffman, 2004:17)



Physical prototyping allows you to build a structure for the game, think through how the various elements interact, and formulate a systemic approach to how the game will function.

This process forces a designer to **think through the design elements of a game** and define them.

(Fullerton, Swain & Hoffman, 2004:163)





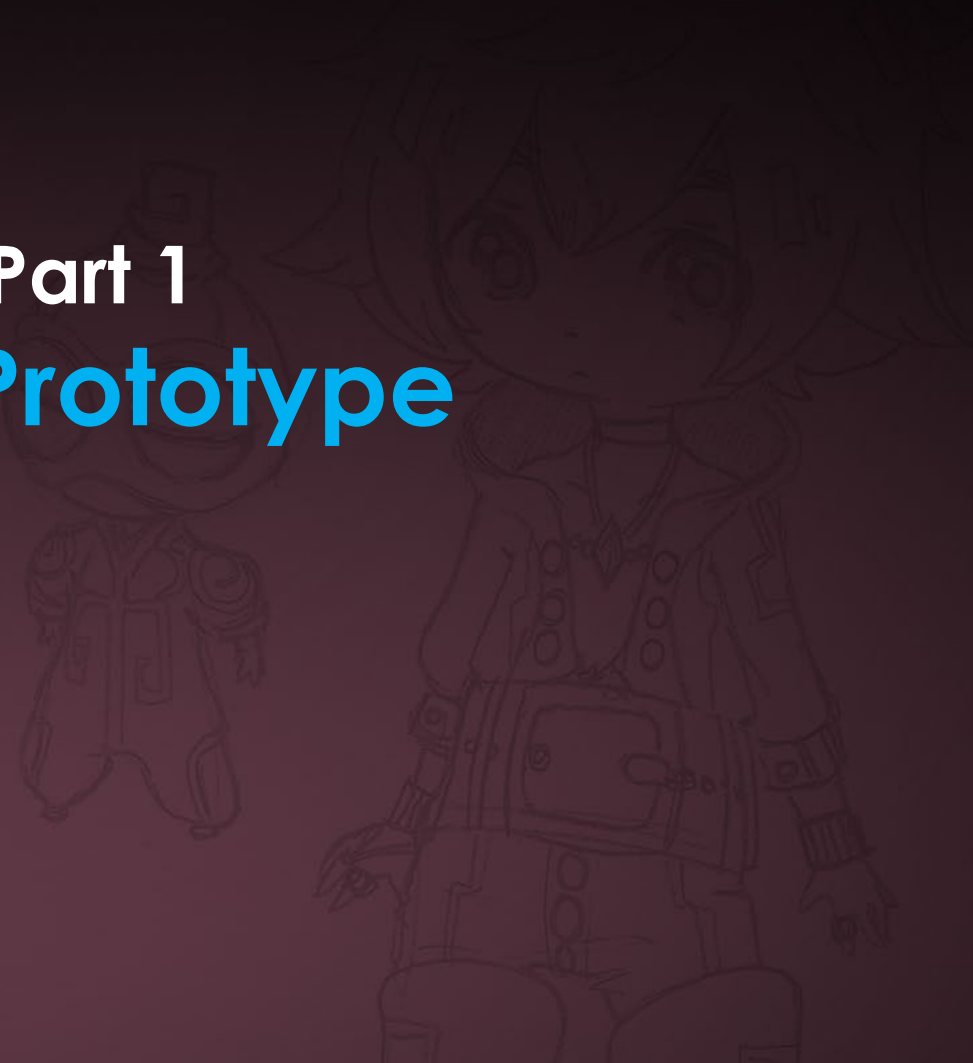
Game Prototyping: Part 1

Building a Physical Prototype



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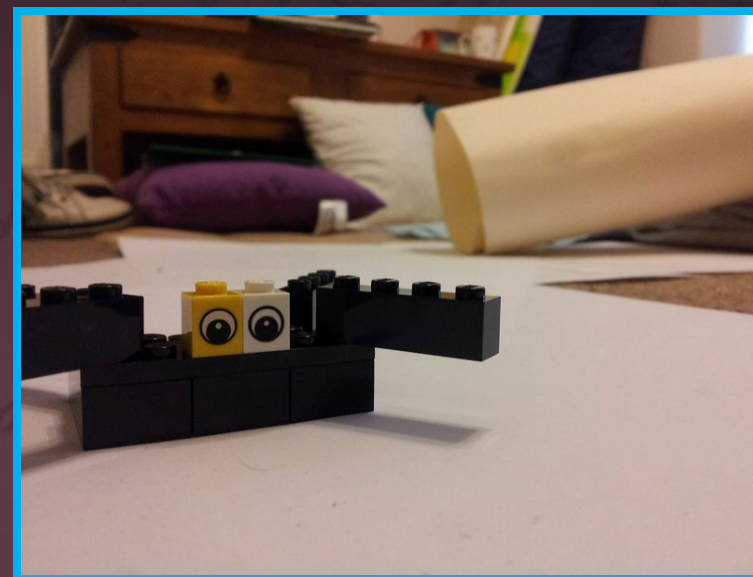
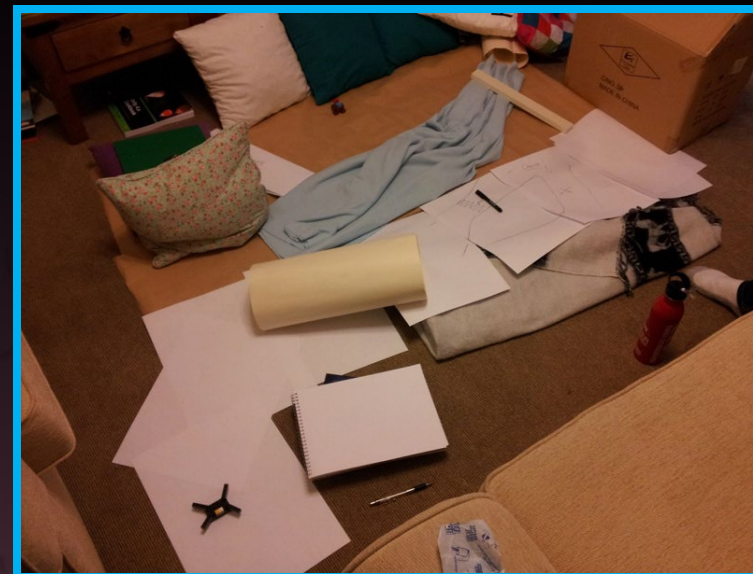




GAME THEORY & DESIGN

Game Prototyping: Part 1

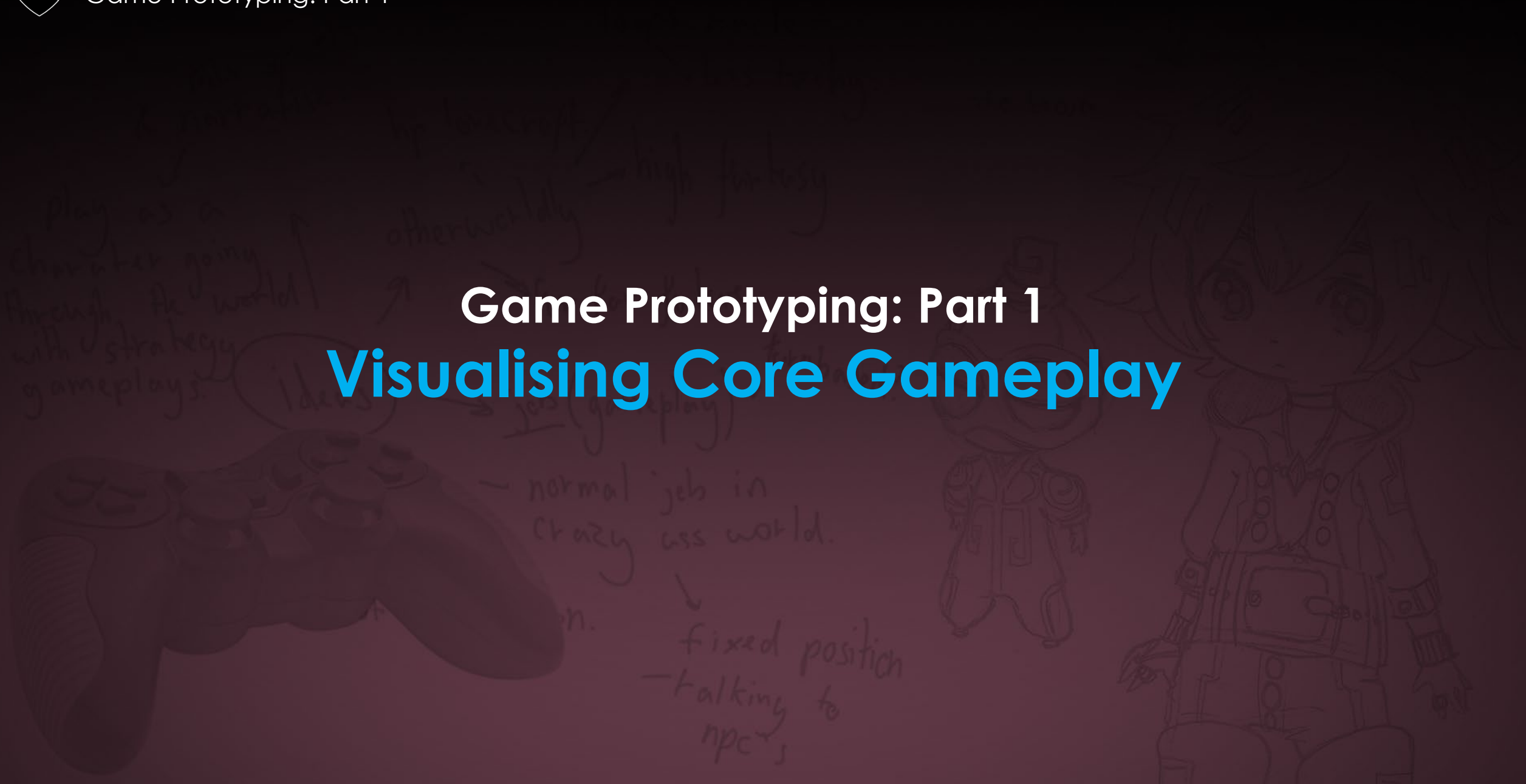
Building A Physical Prototype





Game Prototyping: Part 1

Visualising Core Gameplay





If you try to design the entire game at once, you may become confused and overwhelmed.

There are so many elements in a typical game that it's difficult to know where and how to start.

Isolate the **core gameplay mechanism** and build out from there.

(Fullerton, Swain & Hoffman, 2004:172-173)



The **core gameplay mechanism** can be defined as this:

“The one action the player repeats most often while striving to achieve the game’s overall goal.”

By starting from the centre and working outwards, you will see other possibilities, variables and potential for expansion unfold.

(Fullerton, Swain & Hoffman, 2004:172-173)



Core gameplay mechanism examples:

Warcraft 3: Players build and move units on an overhead map in real time with the intent of engaging opposing units in combat and destroying them.



(Fullerton, Swain & Hoffman, 2004:174)



Core gameplay mechanism examples:

Monopoly: Players roll two dice and move around a board with the goal of buying up properties and charging rent to anyone who lands on them.

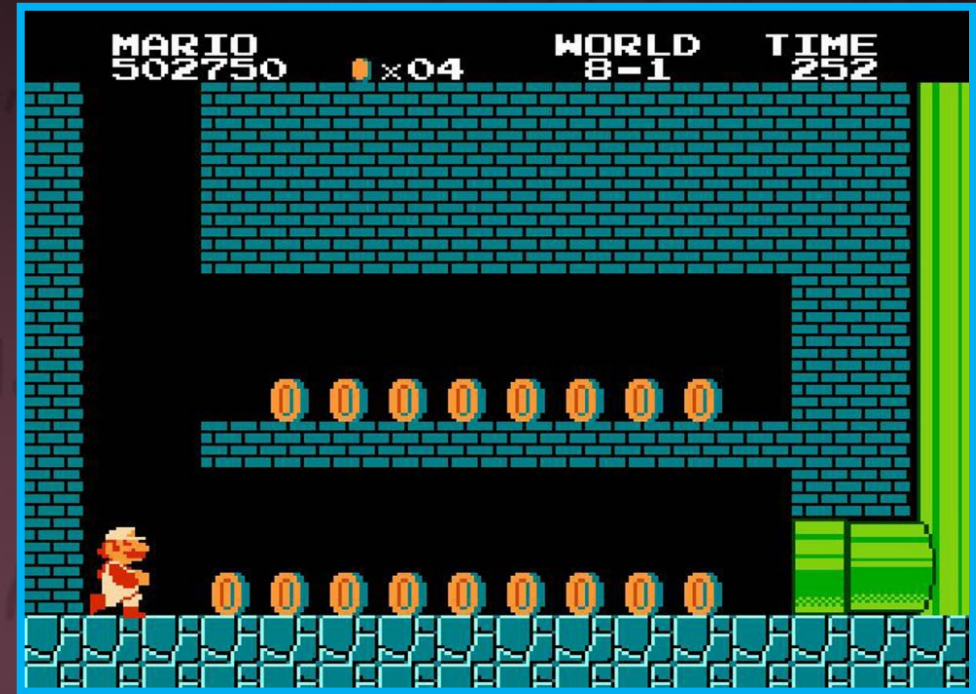


(Fullerton, Swain & Hoffman, 2004:174)



Core gameplay mechanism examples:

Super Mario Bros.: A player controls Mario (or Luigi), making him walk, run, and jump, while avoiding traps, overcoming obstacles, and gathering treasure.



(Fullerton, Swain & Hoffman, 2004:174)



Exercise

Describe other games using this method, looking only at core gameplay mechanisms to define them.

- **Super Hexagon** (GS account 1-6)
- **Moving Out** (GS account 7-12)
- **Party Hard** (GS Account 16-20)

Can they be summarised in a simple fashion?



Exercise

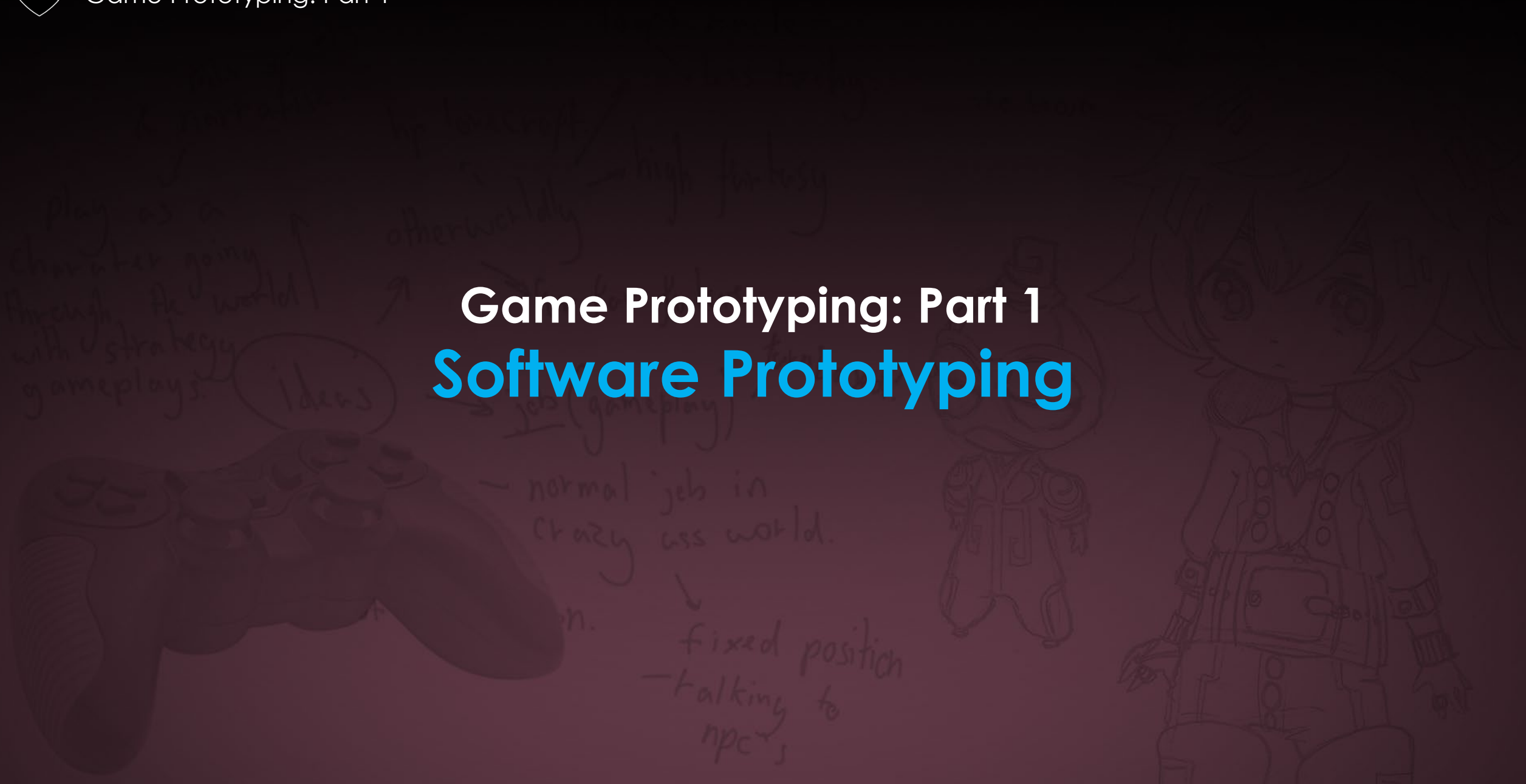
Your own game ideas should be easy to describe using this method.

If not, you may have to **consider your core gameplay mechanism** and develop it before continuing!



Game Prototyping: Part 1

Software Prototyping





Some argue that **physical prototyping** **doesn't accurately represent the player experience** on a computer.



For example, the assumption may be that for a turn-based game, a pen-and-paper prototype is fine, but not for an action based shooter because gameplay is tied to the environment and the player's ability to react in real-time.

(Fullerton, Swain & Hoffman, 2004:163)



GAME THEORY & DESIGN

Game Prototyping: Part 1

Software Prototyping



Physical prototyping is not a replacement for software prototypes, but engaging in this process can benefit the overall gaming system in its early stages.



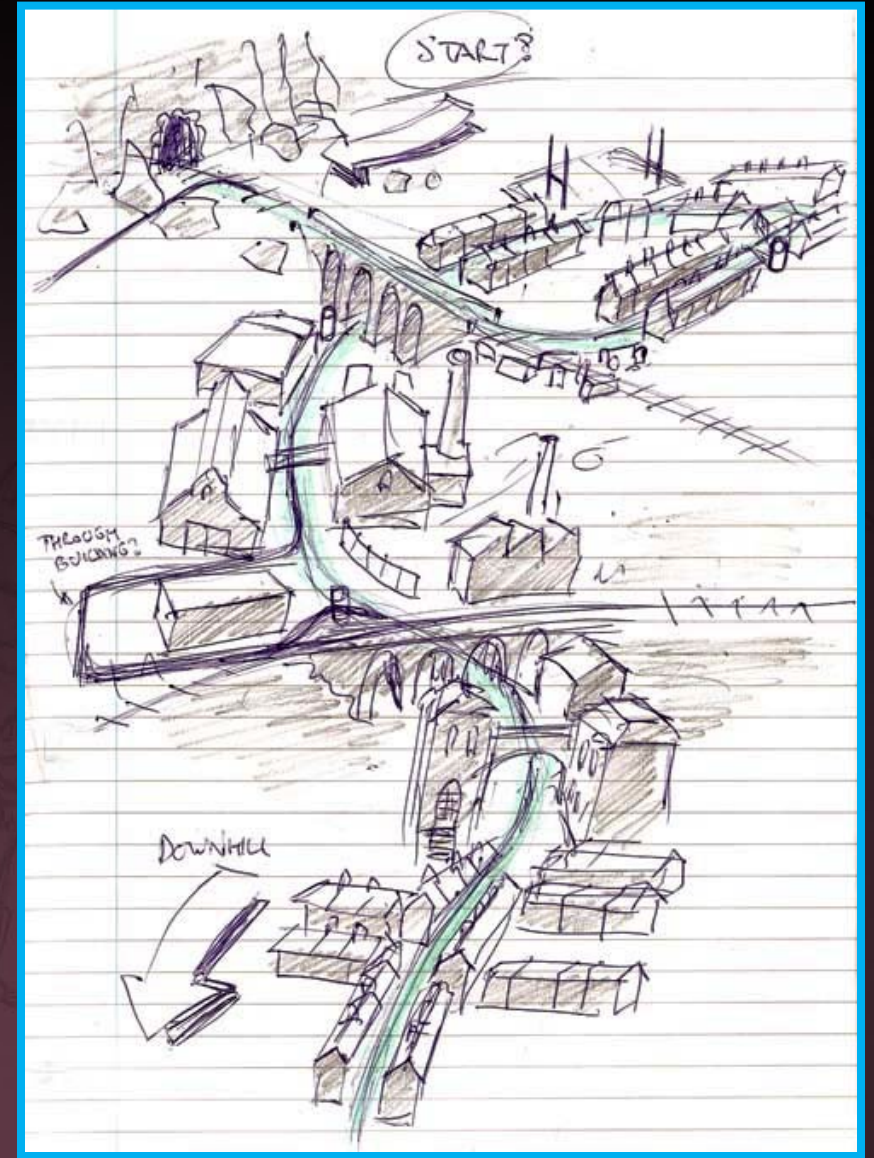
(Fullerton, Swain & Hoffman, 2004:163)



Physical prototyping is only the **first in a long set of steps** to completing a functional digital game.

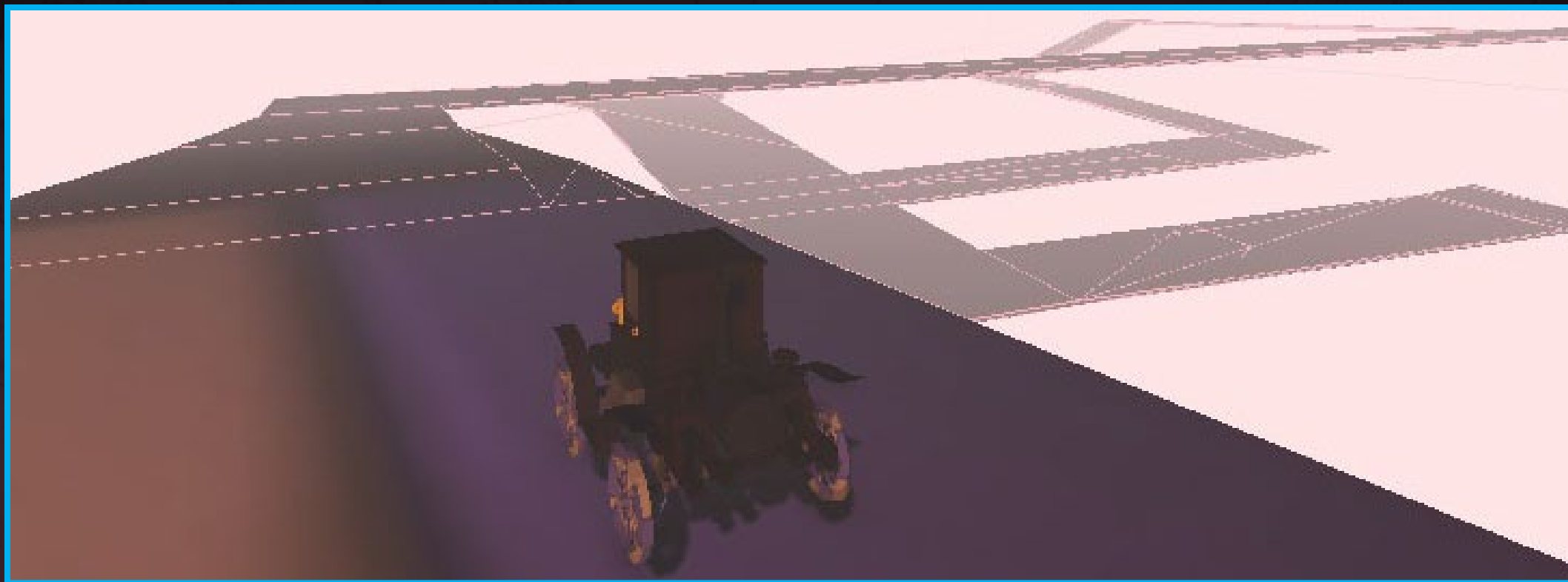
The physical prototype should be used as the systemic blueprint for a **software prototype**.

(Fullerton, Swain & Hoffman, 2004:180)





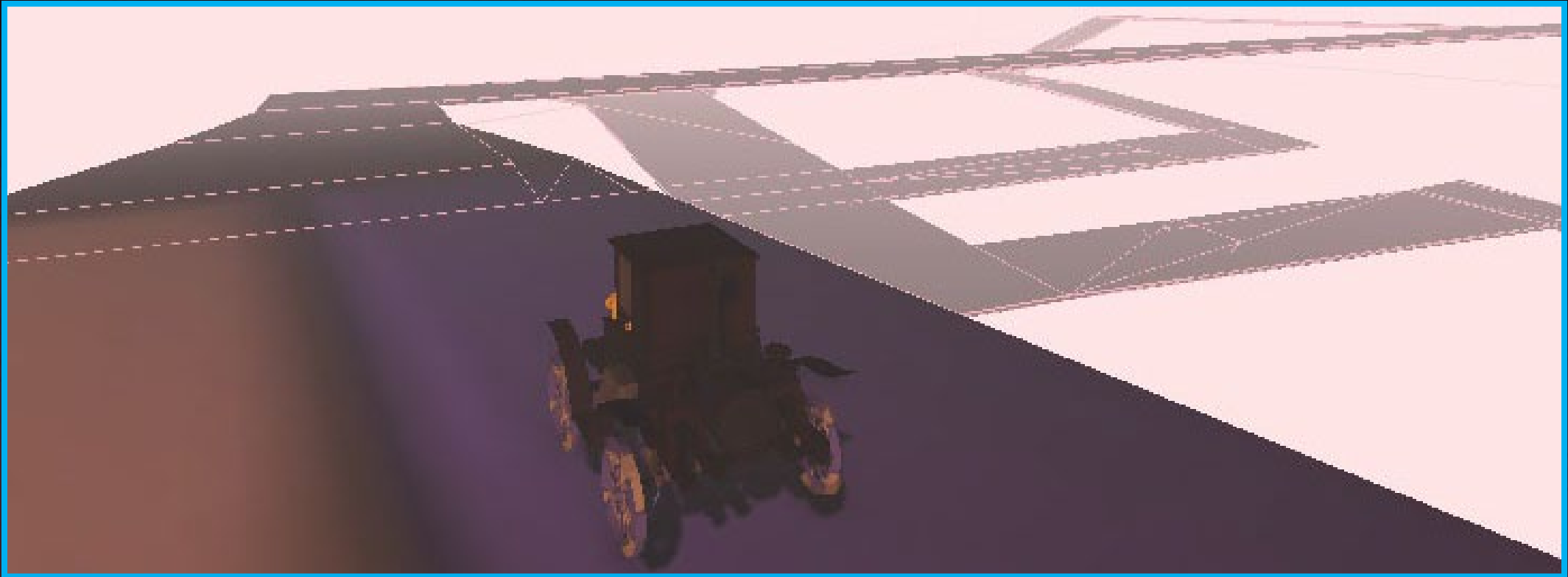
Taking a physical prototype and turning it into a digital design will change the nature of how players will access the game, but **the core mechanics will still be valid.**



(Fullerton, Swain & Hoffman, 2004:180)



The main differences you will find in translating the physical prototype to a digital design are in the **controls and interface**.



(Fullerton, Swain & Hoffman, 2004:180)



“Imagine getting in a room with programmers who know nothing about the project and trying to describe to them the game you have in your head. It’s not easy.

If you want to create gameplay that people have never seen before, it may be impossible.

*A **Physical prototype** that they can sit down and play ensures that they will be able to grasp your vision of the game.”*

(Fullerton, Swain & Hoffman, 2004:163-164)



Software prototypes can be extremely useful, but without clear goals they can escalate into monsters more complex to build than the problem the designer is trying to solve.

The goal should be to create a tool to help in your game design efforts, not to show off graphical capabilities or elegant software architecture.

(Mikros, cited in Fullerton, Swain & Hoffman, 2004:165)



Software prototypes include **only** the elements needed to make the game system functional.

They do not include:

(Fullerton, Swain & Hoffman, 2004:164)



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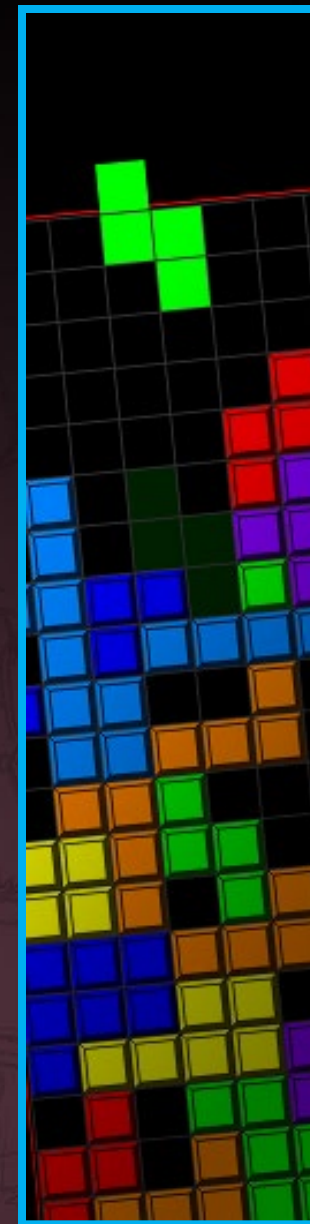
Prototypes serve as the conceptual blueprint for creating the final game.

(Fullerton, Swain & Hoffman, 2004:164)



There are times where a **software prototype** is necessary to get a feel for how a game is supposed to work.

Nikita Mikros uses *Tetris* as an example.





“How would one model the game of Tetris in a physical or paper prototype?”

Although the game has its origins in a physical puzzle, it is very tightly bound to a type of interaction that can only be modeled on the computer.

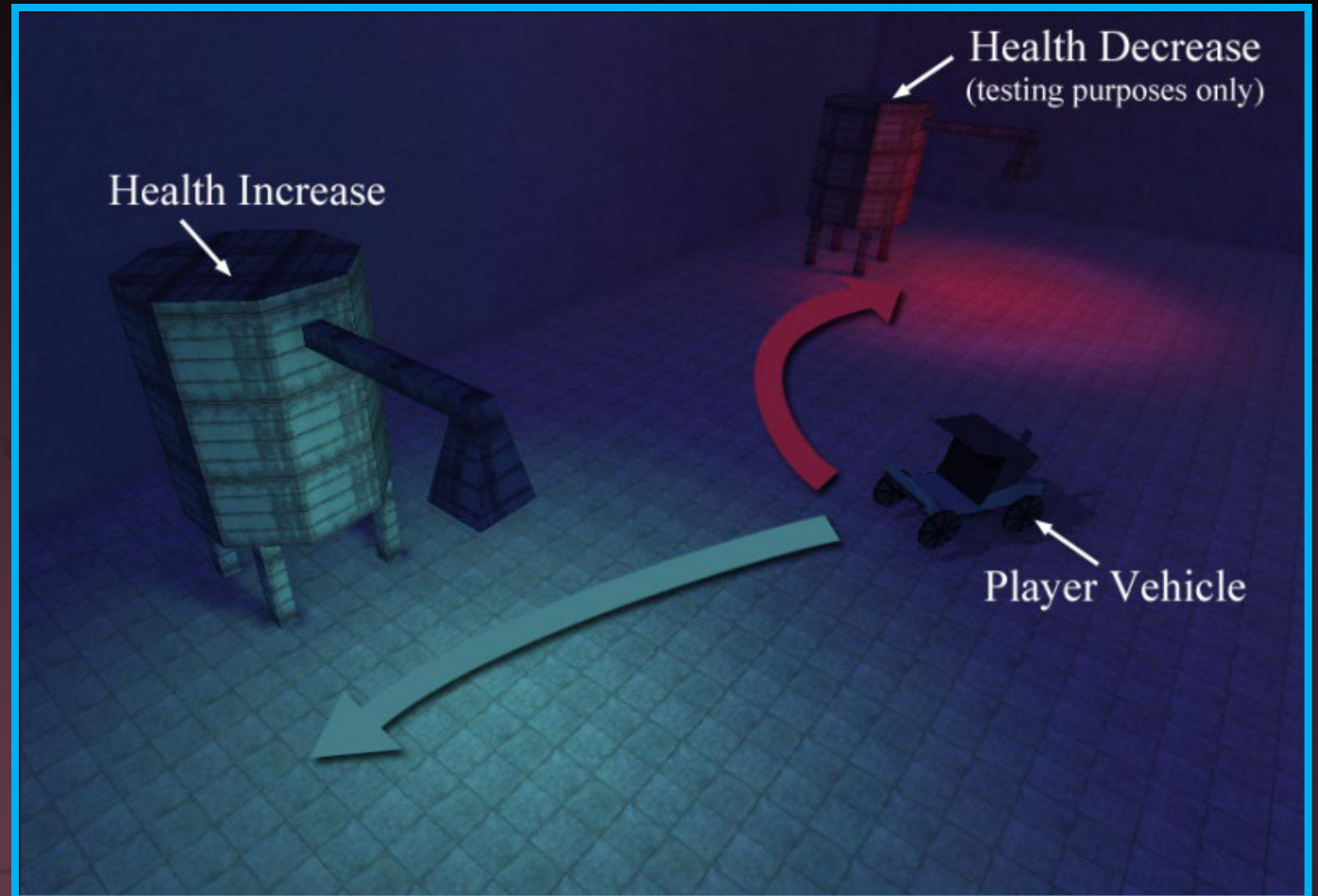
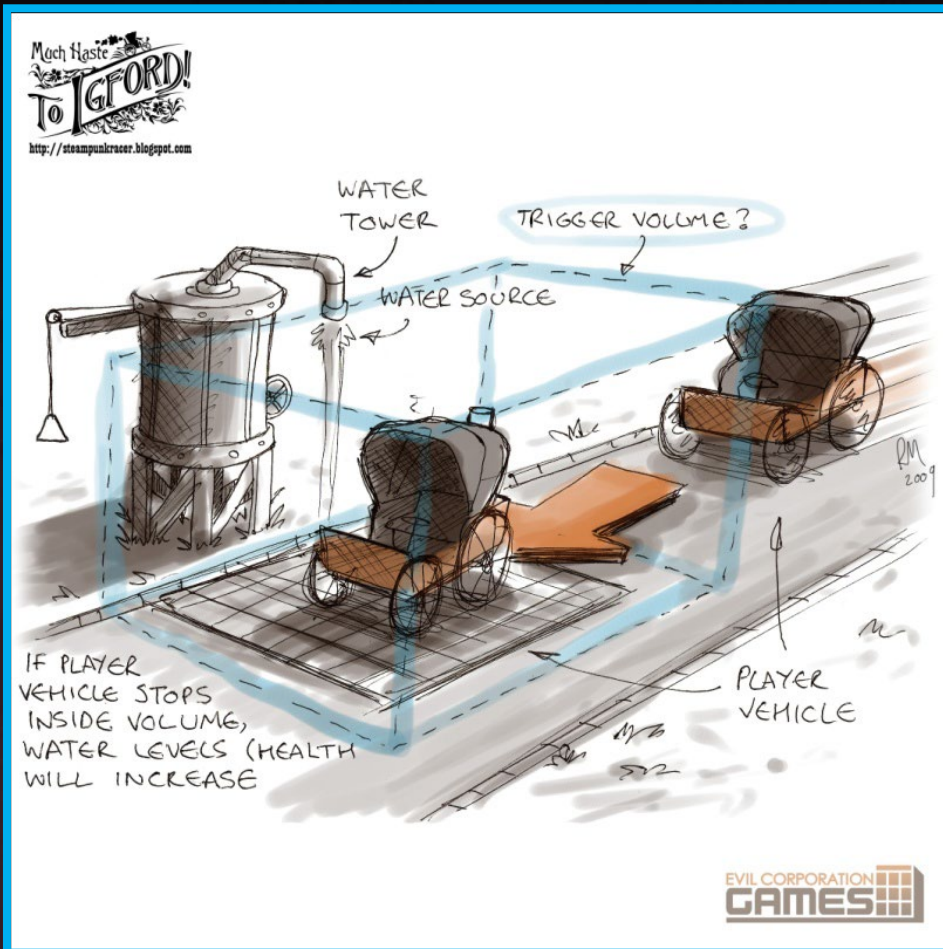
*In this case a physical/paper prototype would be more difficult to construct than a **software prototype.**”*

(Mikros, cited in Fullerton, Swain & Hoffman, 2004:165)





Much Haste to Igford! Water tower test (health regeneration)





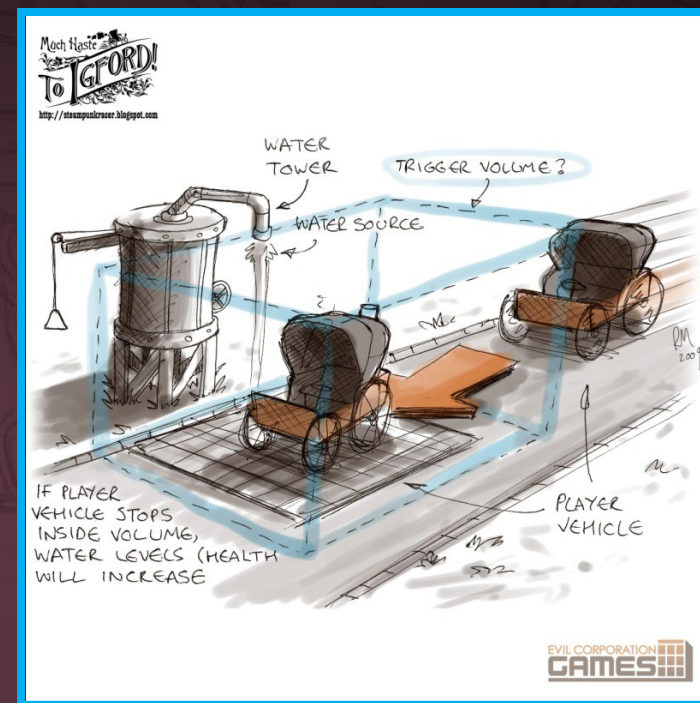
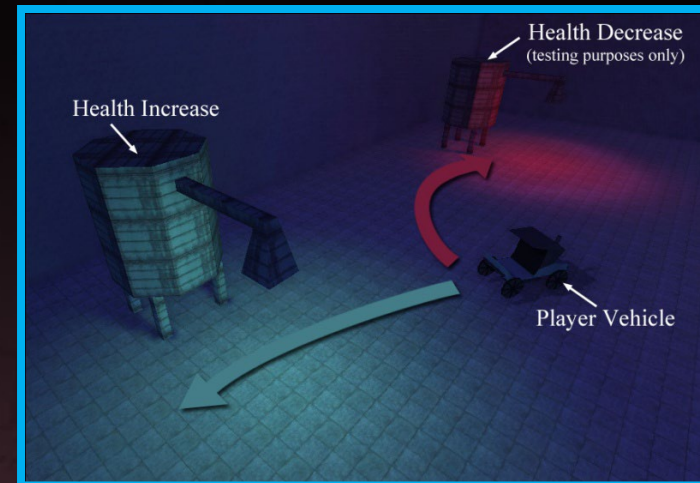
GAME THEORY & DESIGN

Game Prototyping: Part 1



**Much Haste to Igford! Water tower test
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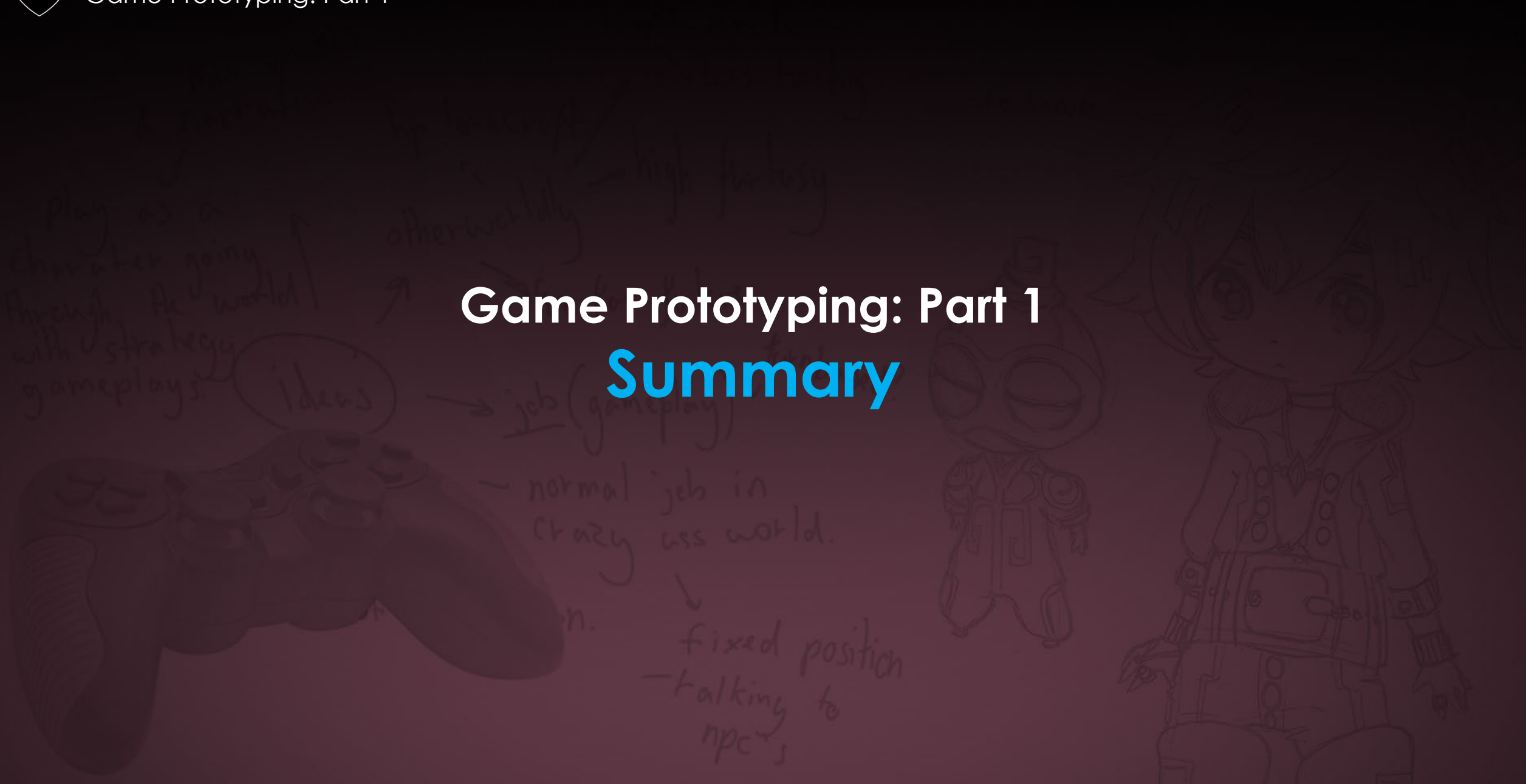
Software Prototyping





Game Prototyping: Part 1

Summary





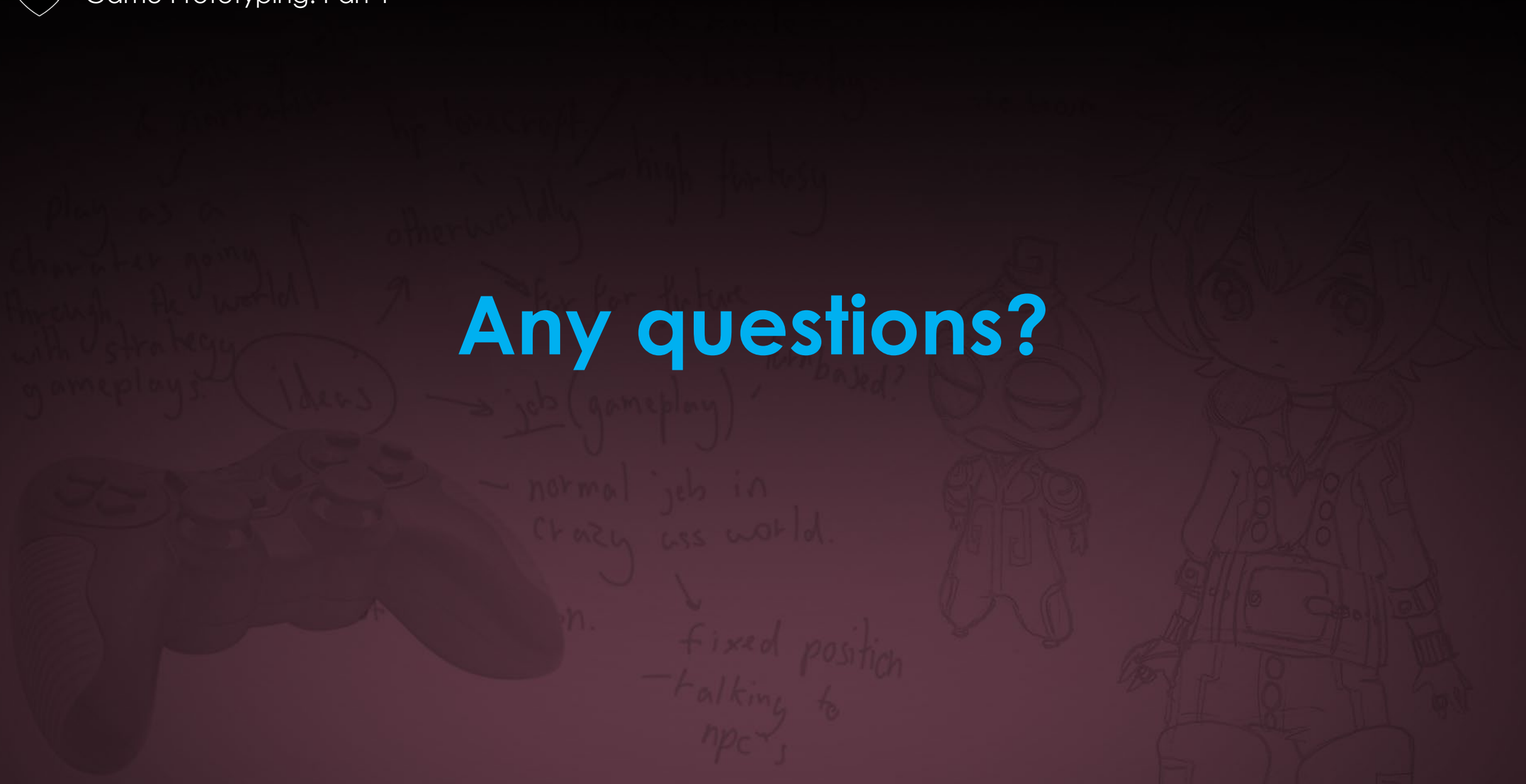
- Overview and definition of Game Prototyping
- Why this process is used and for what purpose
- Physical prototyping
- Software prototyping
- Uses of both & possible limitations



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Game Prototyping: Part 1

Any questions?





Books

Fullerton, T., Swain, C., & Hoffman, S. (2004) *Game Design Workshop*
CMP Books, USA.

Thorn, A. (2014). *Game Development Principles*
Cengage Learning PTR, USA.



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