



UNIVERSITY *of* NICOSIA

Session 7

Gaming NFTs

META511: Non-Fungible Tokens (NFTs) and the Metaverse

We are here

1. What is an NFT?
2. Copyright and provenance in NFTs
3. PFPs
4. Art NFTs
5. Generative art
6. Key Considerations in the NFT Space
- 7. Gaming NFTs**
8. What is a metaverse?
9. Trends in visualization technology
10. Financing models for NFTs and the metaverse
11. Off-chain objects and the broader environment
12. A vision for the future

Week 7 →

We will cover Gaming NFTs

- A short history of video games
- The game creation process
- Game assets: ownership, interoperability, transferability
- Game assets as blockchain-based NFTs
- Play-to-Earn (P2E) games
- The gaming NFT market

This is an educational course only

- We will discuss various projects, individuals or NFTs in this course
- These projects, tokens or the individuals associated with them, are only referenced for educational purposes
- Nothing in this course should be taken as a recommendation to buy or sell an NFT or token or any other financial instrument or security
- More generally, cryptoassets are extraordinarily volatile investments. Please take care if you are buying cryptoassets
- The information provided during this session does not, and is not intended to, constitute legal advice.
- Instead, all information, content, and materials made available is intended for general educational purposes only.

Session 7: Gaming NFTs

1. Games as proto-metaverses

What is a Video Game?

Video games can be thought of as metaverse-y experiences

“A game is an interactive experience that provides the player with an increasingly challenging sequence of patterns which he or she learns and eventually masters” – Raph Koster

- Video games involve interaction with a **user interface** or input device: joystick, controller, keyboard, or motion sensing device.
- Visual feedback is shown on a **video display device**, such as a TV set, monitor, touchscreen or virtual reality headset.
- Most computer games create a **virtual world** on which action takes place.

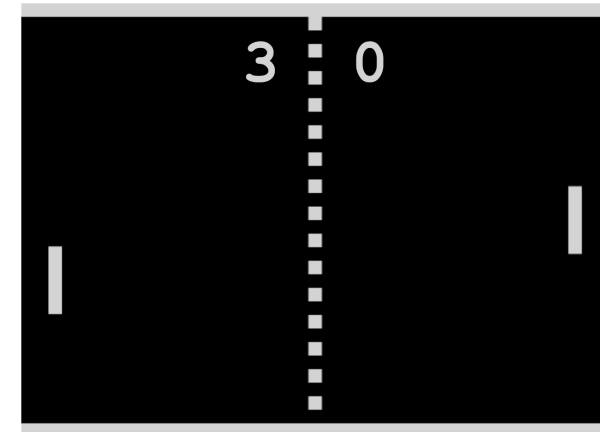
Virtual worlds + display devices + user interaction = sounds like a basic definition of the metaverse!

Source: [Raph Koster](#)

How it all started

Pong Arcade (1972)

- Table tennis–themed arcade game, featuring simple 2D graphics.
- Developed by **Atari**, created by **Allan Alcorn** – as a training exercise assigned to him by Atari co-founder Nolan Bushnell 😊
- The game's concept was based on an electronic ping-pong game included in the Magnavox Odyssey, the first home video game console (Magnavox later sued Atari for patent infringement).



Mass adoption of computer games

From arcade to console: computer games as home entertainment



Game Genres

○ Video games are generally categorized into genres based on their **gameplay interaction**:

- Adventure
- Fighting
- Platform
- Puzzle
- Racing
- Role-playing
- Shooter
- Simulation
- Sports
- Strategy
- ...

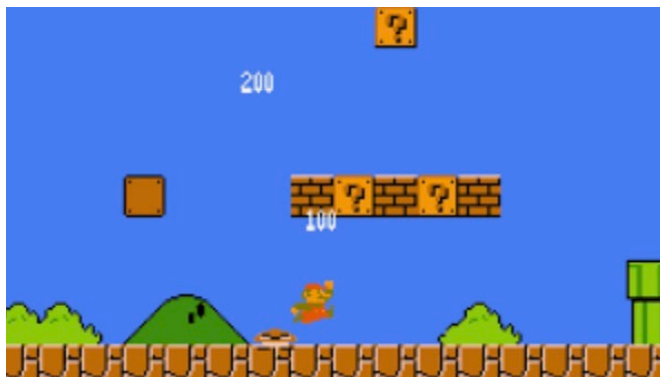
First-Person Games: The players' perspective is the camera view – players rarely see their avatar.

Third-Person Games: The player controls their avatar shown in front of them.



Games can also be classified according to dimensionality

- **2D games** use only two dimensions. They feature flat characters and backgrounds. Example: Super Mario.
- **2.5D games** portray 3D environments, while incorporating 2D gameplay (more technically, 3D gameplay but using 2D sprites, instead of 3D models). Examples: Wolfenstein.
- **3D games** use a 3D camera perspective, either first- or third-person. Examples: Halo, Half Life, Elden Ring, Skyrim.







RPGs, MUDs & MMORPGs

- Most video games are **Role Playing Games (RPGs)**: the player assumes the role of a character and takes control of that character's actions.
- A sub-genre of RPGs that became popular was that of **Multi-User Dimension (MUD)** games (originally, multi-user dungeon games), which implement fantasy or science-fiction worlds, typically text-based or storyboarded.
- From those, evolved today's **Massively Multiplayer Online Role-Playing Games (MMORPGs)**, which combine aspects of RPGs and MUDs.
- A major difference is that these games feature **persistent worlds**, which continue to exist and evolve, even if a player is away from the game (offline).

Game Classifications

MMORPGs are hugely popular

| RANK | GAME | ACTIVE PLAYERS TODAY | TOTAL PLAYER COUNT | |
|------|-----------------------------------|----------------------|--------------------|--|
| 1 | World of Warcraft | 1.16M | 122.23M |  |
| 2 | Old School RuneScape | 1.40M | 36.75M |  |
| 3 | FINAL FANTASY XIV: A Realm Reborn | 1.15M | 40.41M |  |
| 4 | World of Warcraft Classic | 782.73K | 27.46M | |
| 5 | Path of Exile | 773.58K | 27.14M |  |

Gaming is a huge industry

- More than **3.2 billion people** worldwide play games.
- E-Sports audiences in 2022 have grown to **half a billion people**.
- So, almost one in two people are game players and one in sixteen watches others play games competitively
- The global gaming market is projected to be **worth > \$250bn** by 2025.































Sources: 1. [Gaming Industry Worth](#)

Where are games sold? – Video Game Storefronts

- **Console:**
 - Microsoft Store
 - Nintendo eShop
 - PlayStation Store
- **Mobile:**
 - Amazon Appstore
 - Apple App Store
 - Google Play Store
 - Huawei AppGallery
 - Samsung Galaxy Store
- **PC – Websites:**
 - Direct2Drive
 - DotEmu
 - GameHouse
 - Game Jolt
 - GamersGate
- **PC – Websites (cont):**
 - GOG.com
 - Green Man Gaming
 - Itch.io
 - Metabol
- **PC – Platforms:**
 - Amazon Games - Amazon.com
 - Battle.net - Activision-Blizzard
 - Beamdog - IdeaSpark Labs, Inc.
 - Epic Games Store - Epic Games, Inc.
 - Microsoft Store - Microsoft Corporation
 - Origin - Electronic Arts
 - Riot Client - Riot Games, Inc.
 - Rockstar Games - Rockstar Games
 - Steam - Valve Corporation
 - Ubisoft Connect - Ubisoft Entertainment

Steam is the largest with around 70k titles

IT, consumer electronics, and game studios dominate the industry

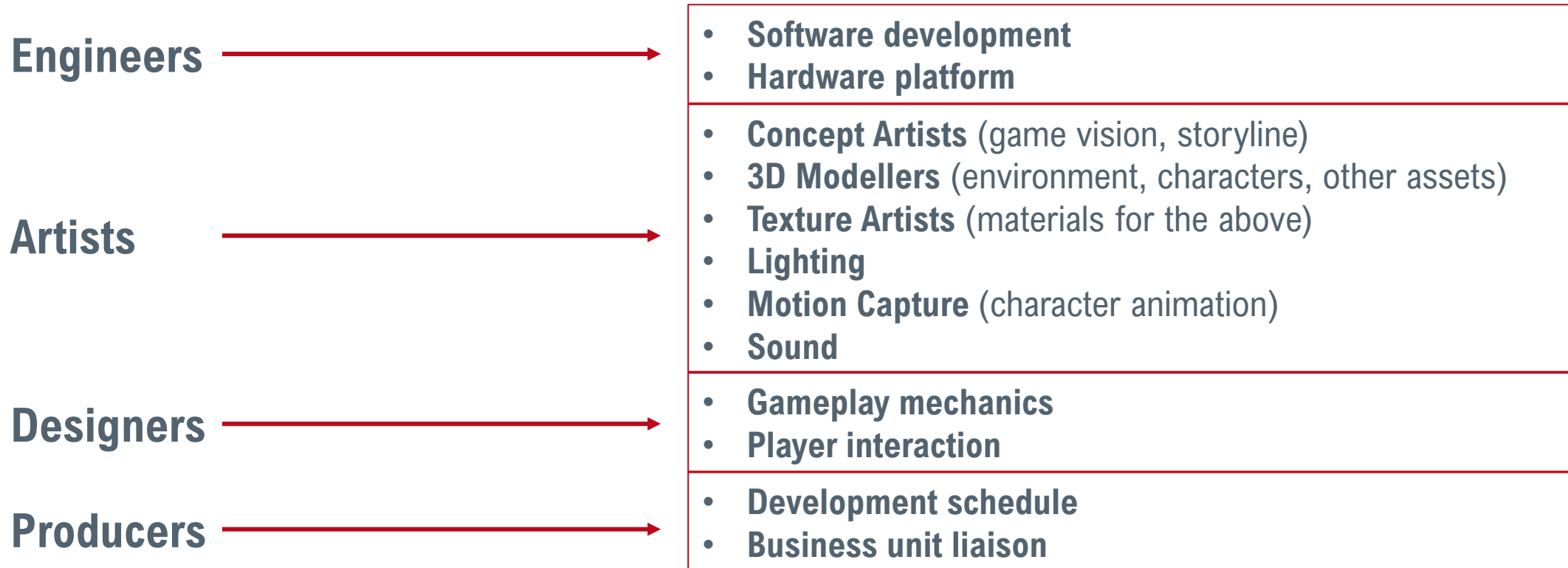
| Rank | Name | Market Cap | Price | Today | Price (30 days) | Country |
|------|--|------------|----------|---------|---|---|
| 1 |  Microsoft MSFT | \$1.650 T | \$221.39 | ▲ 3.33% |  |  USA |
| 2 |  Tencent TCEHY | \$295.87 B | \$30.89 | ▲ 7.52% |  |  China |
| 3 |  Sony SONY | \$92.36 B | \$74.59 | ▲ 3.41% |  |  Japan |
| 4 |  Activision Blizzard ATVI | \$56.29 B | \$71.96 | ▲ 0.08% |  |  USA |
| 5 |  Nintendo 7974.T | \$47.42 B | \$40.60 | ▼ 1.91% |  |  Japan |
| 6 |  NetEase NTES | \$41.06 B | \$62.52 | ▲ 5.70% |  |  China |
| 7 |  Electronic Arts EA | \$36.07 B | \$129.76 | ▲ 2.48% |  |  USA |
| ▲1 8 |  Sea (Garena) SE | \$24.72 B | \$44.01 | ▼ 3.99% |  |  Singapore |
| ▼1 9 |  Roblox RBLX | \$24.21 B | \$40.58 | ▼ 6.28% |  |  USA |
| 10 |  Take 2 Interactive TTWO | \$18.09 B | \$108.53 | ▼ 2.49% |  |  USA |

<https://companiesmarketcap.com/video-games/largest-video-game-companies-by-market-cap/>

Session 7: Gaming NFTs

2. Game Development

Developing a competitive game is a complex project



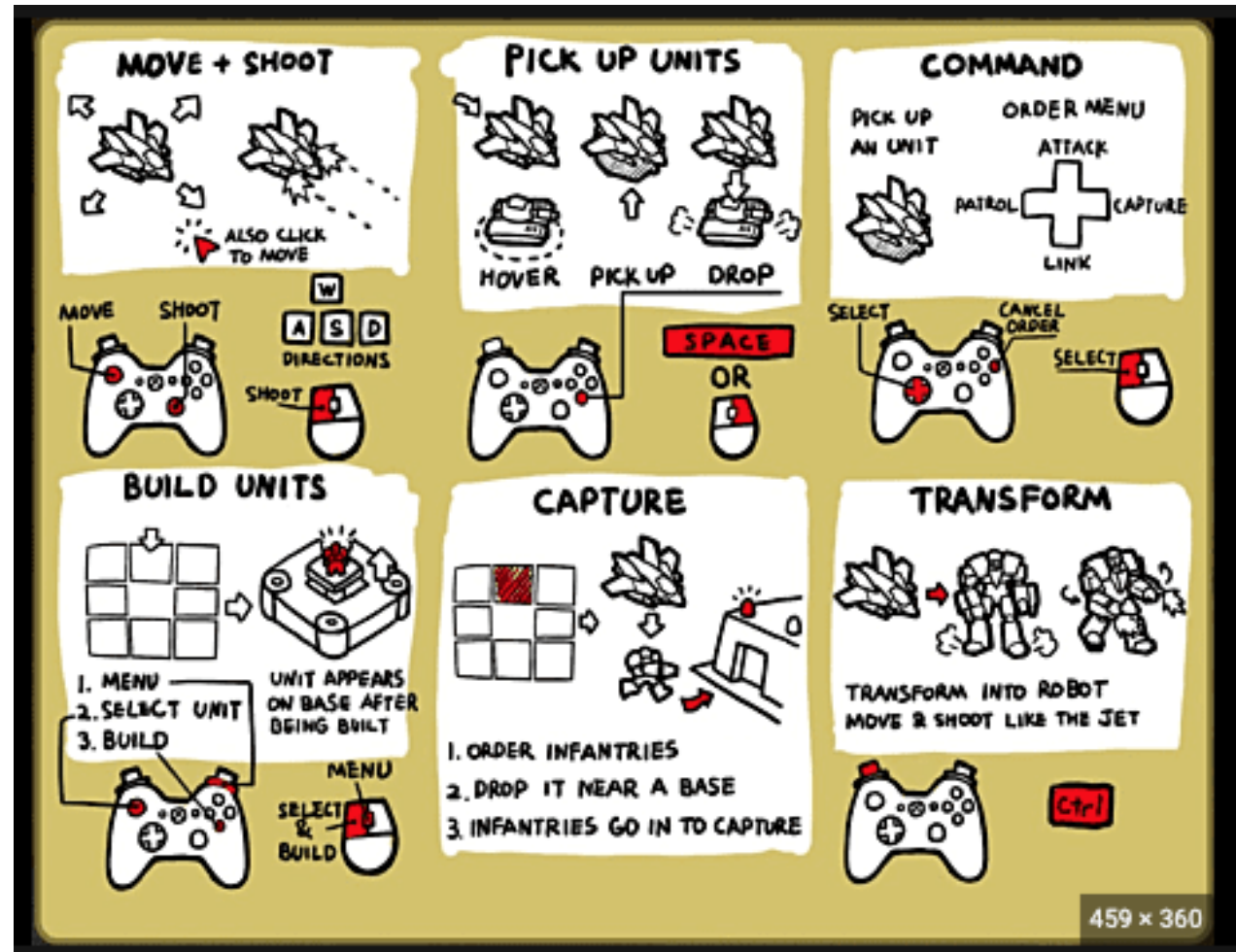
Indie versus AAA

An indie game, short for independent video game, is a video game typically created by individuals or smaller development teams without the financial and technical support of a large AAA game publisher

Gameplay Mechanics

A game's mechanics are **the rules and procedures that guide the player and the game response to the player's moves or actions.**

Through the mechanics you create, you define how the game is going to work for the people who play it



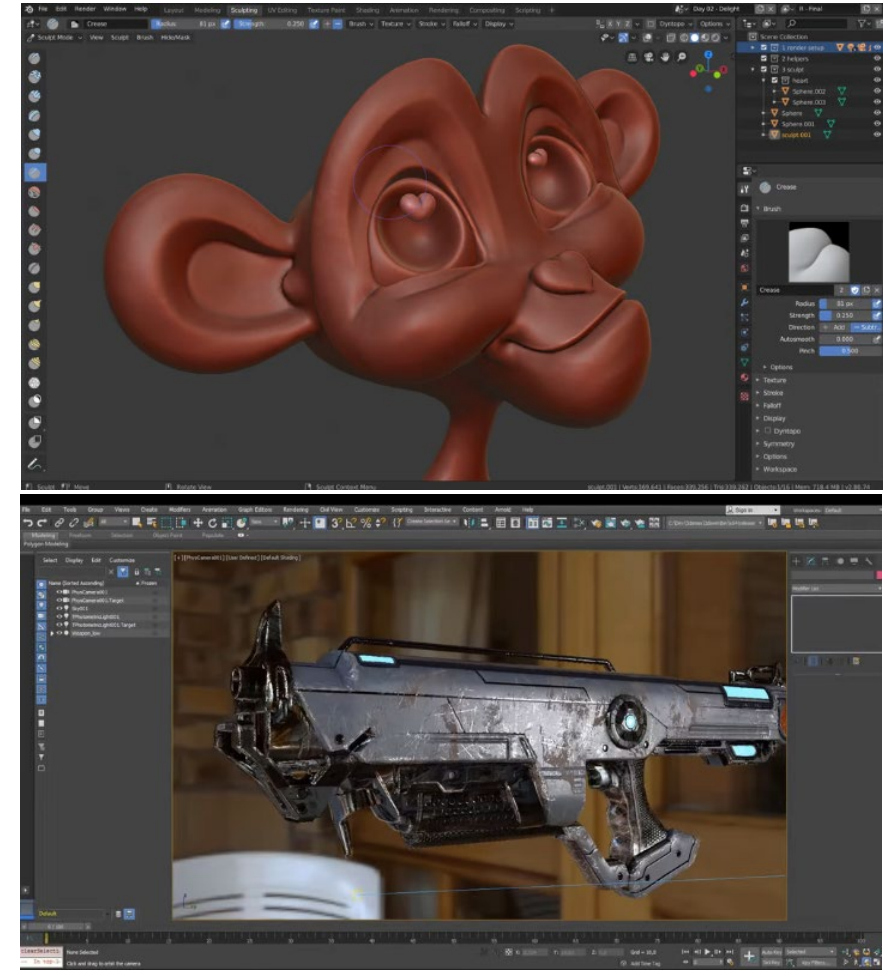
Asset Creation

- Characters – Avatars
- Props
- Environments

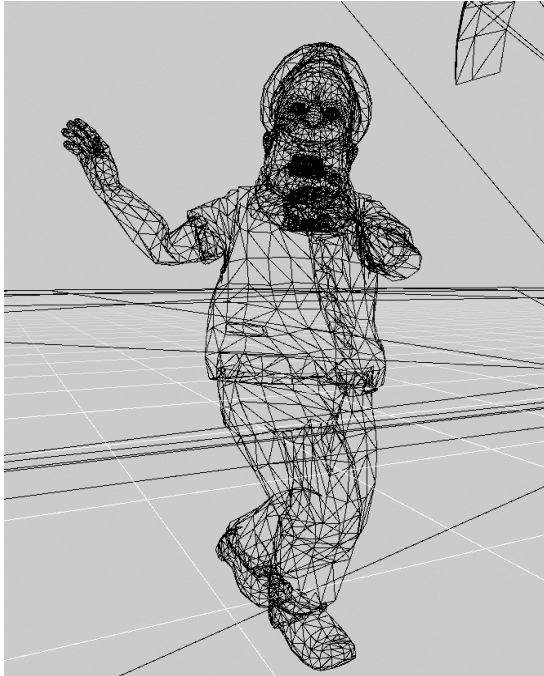


3D Modelling Software:

- Autodesk
 - Maya
 - 3D Studio Max
 - Revit
- Blender
- Stop Motion Studio
- PowToon
- Animaker
- etc

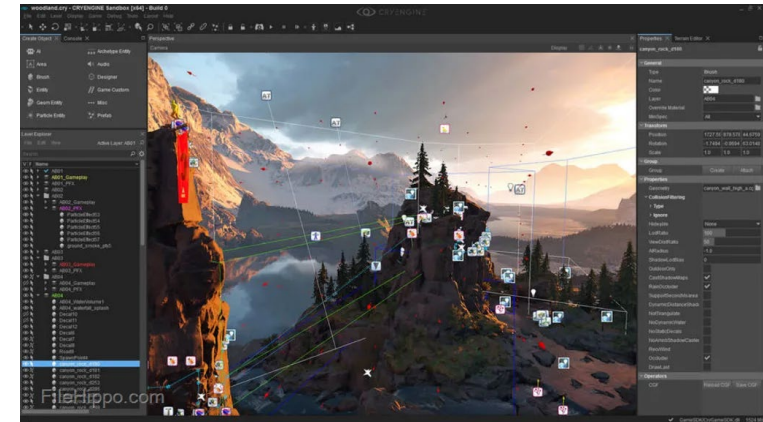
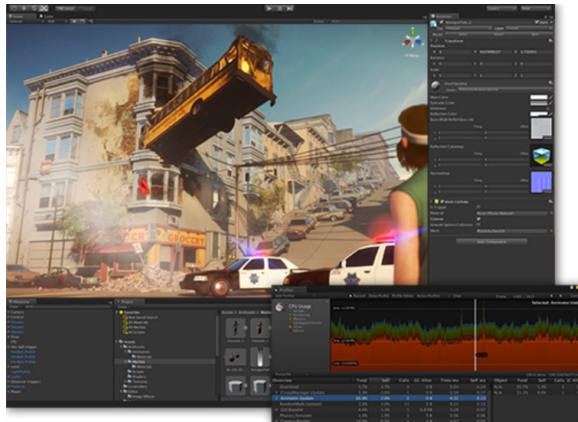
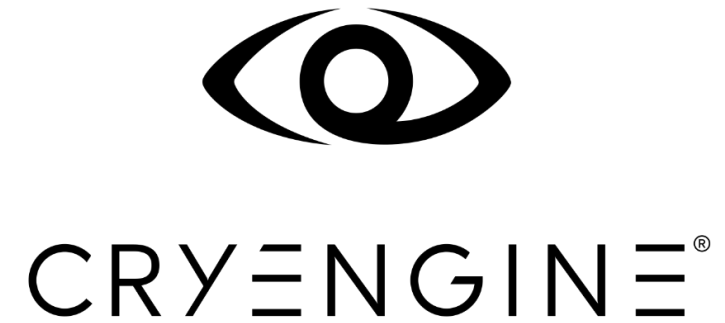


Asset Creation: Character Design



- All game assets have a **polygonal structure**.
- **Texture maps** add more detail

Game Engines



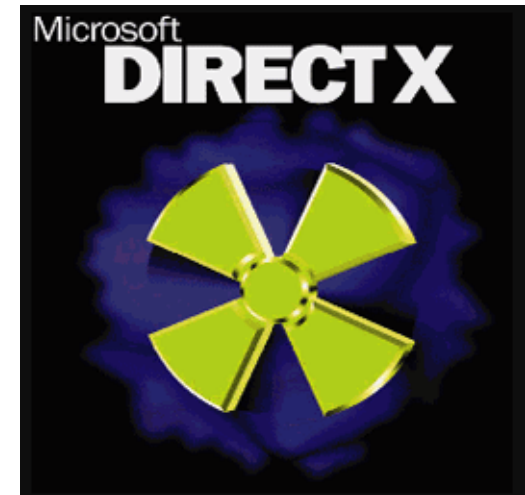
Graphics Libraries



OpenGL is cross-platform graphics API that specifies a standard software interface for 3D graphics processing hardware



JavaScript API for rendering interactive 2D and 3D graphics within any compatible web browser without the use of plug-ins

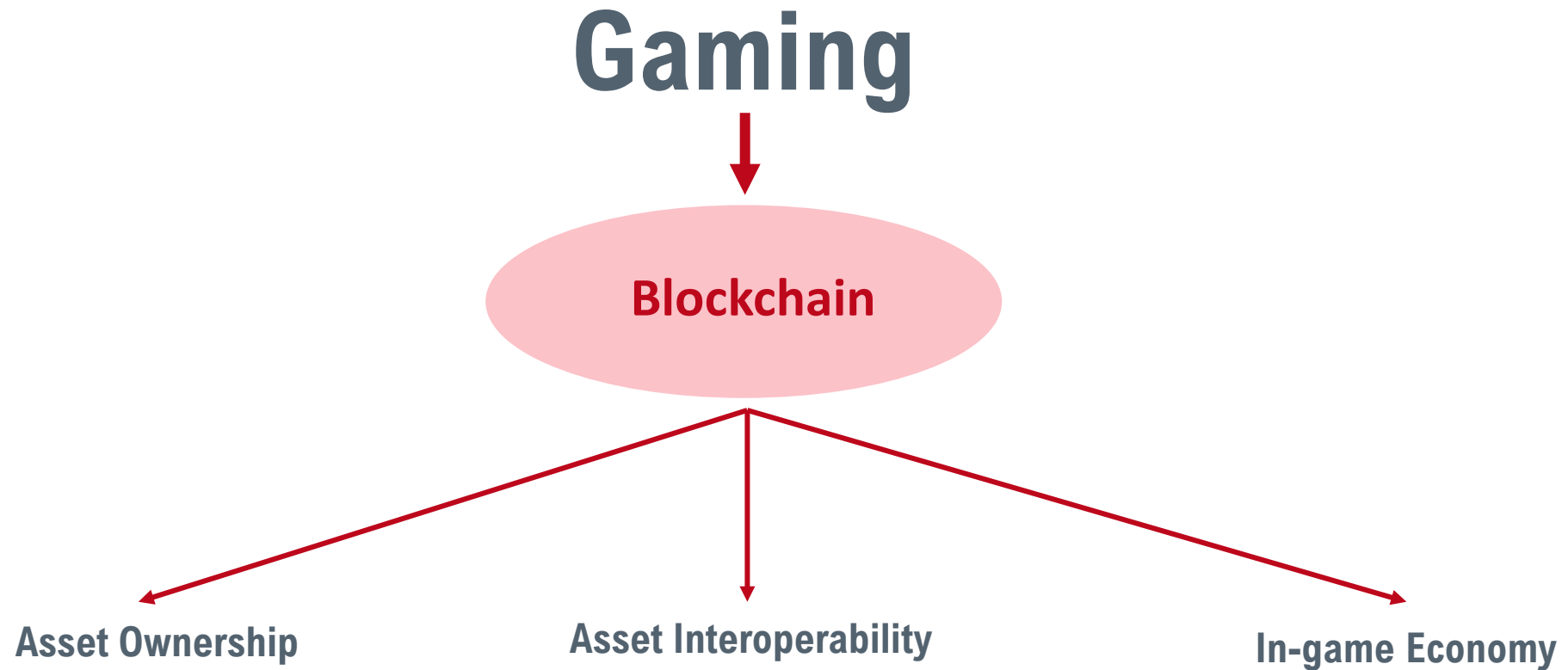


DirectX is an API for multimedia and game programming on the Microsoft platforms

Session 7: Gaming NFTs

3. Blockchain meets Gaming

Blockchain: A layer for storing & transferring value in gaming



NFTs allow for true digital ownership of game assets

NFT games combine conventional gaming designs with unconventional game mechanisms to let users have more control over in-game assets:

- **Players can truly own their characters or avatars** as NFTs.
- **Assets bought or collected while playing the game can also be NFTs.**
- Players can then **swap or trade** their NFTs with other players **without intermediaries or censorship** by the game owner.
- **Avatars/assets can also exist outside of the game** as independent entities, which may have other uses or internal value.




A new gaming genre? Play-to-Earn (P2E)

- **P2E games** allow players to earn financial value (usually in the form of digital tokens) by playing a blockchain-based game.
- They typically fall into two broad categories:
 - Free-to-play: players can play the game for free; typically, they won't be able to earn through playing the game, at least not until they have progressed or contributed enough.
 - Pay-to-play: players will need to be equipped with specific NFTs prior to playing the game for earnings. The properties/rarity of these NFTs will typically determine how much the players can earn, combined or not with the players' skills in the game.
- Players will typically be able to **create or breed new characters** in the game (which can be used in-game or sold in a marketplace), **purchase digital items** on native or third-party marketplaces, and/or **unlock/earn** digital assets in-game.

P2E game examples



- Inspired by Pokémon, it became the first popular P2E game in 2021
- Players can acquire and breed digital pets (Axies), used in gameplay battles.
- Dual fungible token structure: Axie Infinity Shards (\$AXS) is an ERC-20 governance token, while Smooth Love Potion (\$SLP) is the reward token paid out to earners.
- NFT tokens: Tokenized plots of land which act as homes and bases of operation

| |  AXS (Axie Infinity Shard) |  SLP(Smooth Love Potion) |  Axie (NFT) |
|-------------|--|--|--|
| Token Types | ERC -20 / Ronin Token | ERC -20 / Ronin Token | ERC-721 / Ronin NFT |
| Usage | Axie Governance Token (Owner) | In-game play rewards and breeding | Game Character (Ticket) |
| How to Use | <ul style="list-style-type: none"> • Key decision making by staking and revenue distribution (TBA) • Use 2 AXS for each breeding • Use as a game/market payment | <ul style="list-style-type: none"> • Use for breeding (7 breeding per Axie, cost increases by 5 for each try) | <ul style="list-style-type: none"> • Requires at least 3 for exploration and battle • ETH version will not be used in the game from May 29th |

Source: [P2E report](#)

Other P2E games



The image shows the 'StepN' game interface. It features a sneaker NFT with various attributes and stats. The sneaker is colorful and has a 'STEPN' logo. The interface includes a 'Quality' section with 'COMMON', 'UNCOMMON', 'RARE', 'EPIC', and 'LEGENDARY' options. It also shows 'Efficiency' (Enhance GST earning) and 'Luck' (Enhance Mystery Box drop rate). The sneaker's attributes include 'Mileage', 'Comfort', and 'Resilience'. The interface also shows a 'Bank 1000 Steps' goal and a 'Step History' graph.

HIGHER QUALITY SOCKET BOOSTS THE GEM'S ATTRIBUTE

QUALITY
COMMON UNCOMMON
RARE EPIC LEGENDARY

EFFICIENCY
Enhance GST earning

LUCK
Enhance Mystery Box drop rate

INCREASE SNEAKER'S ATTRIBUTE WITH GEMS

REPAIR AFTER MOVING OUTDOORS

COMFORT
Enhance GMT earning (at level 30)

RESILIENCE
Reduces repair costs



Challenges in gaming NFTs

- **We are still early** in the NFT gaming phenomenon, including P2E games.
- It has proven to be very **challenging to create a self-sustaining in-game economy**.
 - Dual-layer (fungible and non-fungible), multi-token (governance, utility, NFTs) structures have been used, but a proven token economics mechanism that is successful in the long-run is yet to emerge.
- Some analysts claim that **monetary rewards may prove to be bad for player retention**, as they can weaken intrinsic motivation.
 - Still, most games today seem to emphasize tokenomics more than game design.
- There are also **technical challenges** in creating 100% decentralized games, stemming from the characteristics of blockchains: lack of speed, ability to front-run publicly visible transactions, etc.
 - Hence, most games are still only partially decentralized.

What did we learn?

Takeaways from week 7

- Gaming is a huge industry – if it moves to blockchain *en masse*, it can prove to be the killer application of NFTs.
- Blockchain can act as a value layer for games, enabling:
 - Asset Ownership
 - Asset Interoperability
 - In-game Economies
- Yet, there are still significant challenges to be overcome, both technological/design and economic.
- Games can be thought of as early examples of metaverses and may prove to be the application type through which most people will have their first exposure to Web3.

Where can I find out more?

Further reading

- [What is Play to Earn:](#) Article from Binance academy explaining the Play to Earn Scheme.
- [NFTs and the Metaverse Revolution – Research Perspectives and Open Challenges:](#) An article that contributes an analysis of the current status of virtual worlds with a focus on the emerging blockchain-based metaverse and articulates the open challenges and research perspectives for the emerging space of blockchain-based metaverses.
- [Insights on the metaverse and the future of gaming:](#) Survey on gaming executives for future gaming
- [Simulations and simulacra – History in video games:](#) An article by Elliott and Andrew about the history of video games
- [Introduction to Game Design, Prototyping, and Development: From Concept to Playable Game with Unity and C#:](#) A book that can help you learn game design, prototyping, and programming with Unity and C#.
- [Cryptokitties transaction network analysis:](#) An article discussing the rise and fall of the first blockchain game mania.



UNIVERSITY *of* NICOSIA

Questions?

Contact Us:

Twitter: **@unicmetaverse**

Course Support (Discord): **discord.gg/joinUNIC**

Course Support (Email): **metaverse@unic.ac.cy**