Augmented and Virtual Reality

CSCI 3907/6907
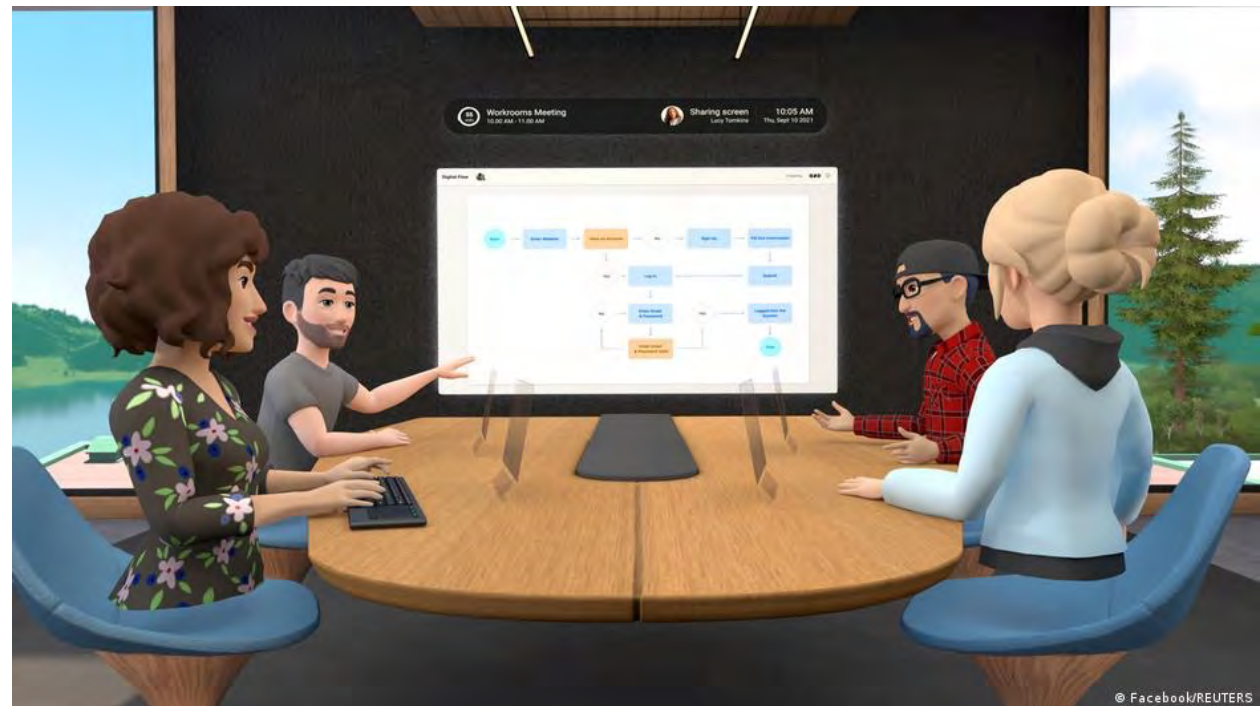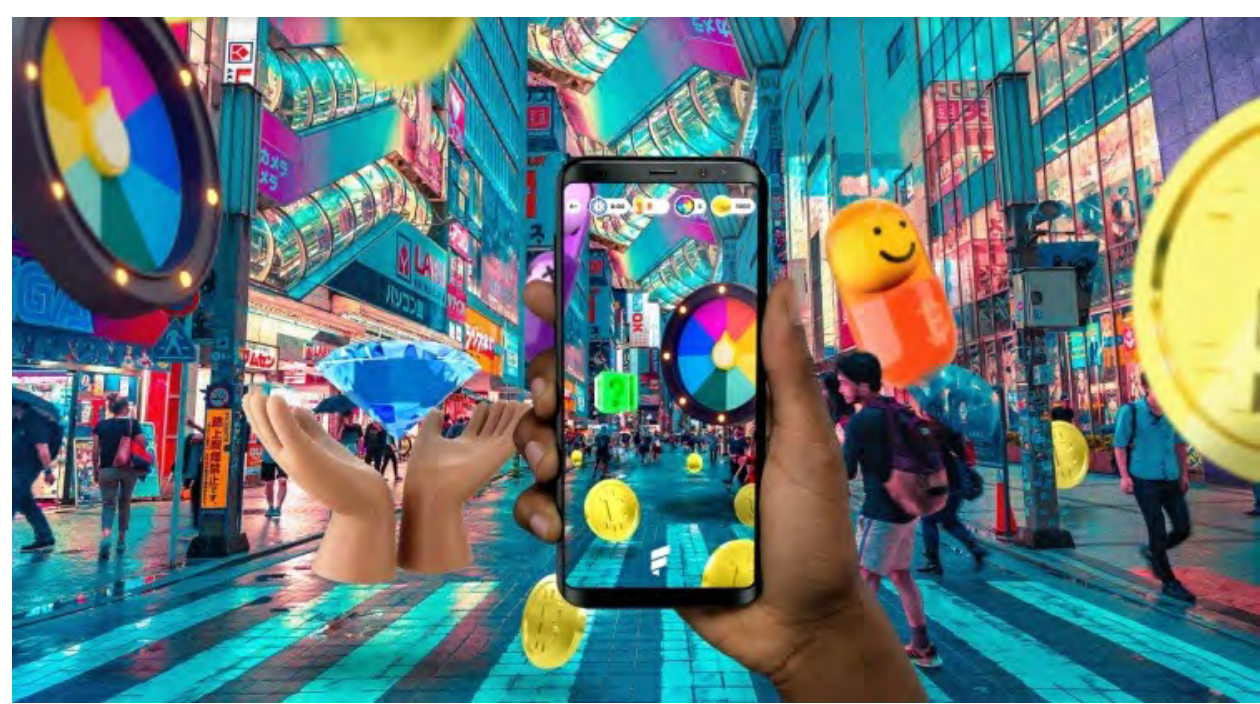
Spring 2022

3:30 PM - 6:00 PM, Thursdays

Special: Metaverse

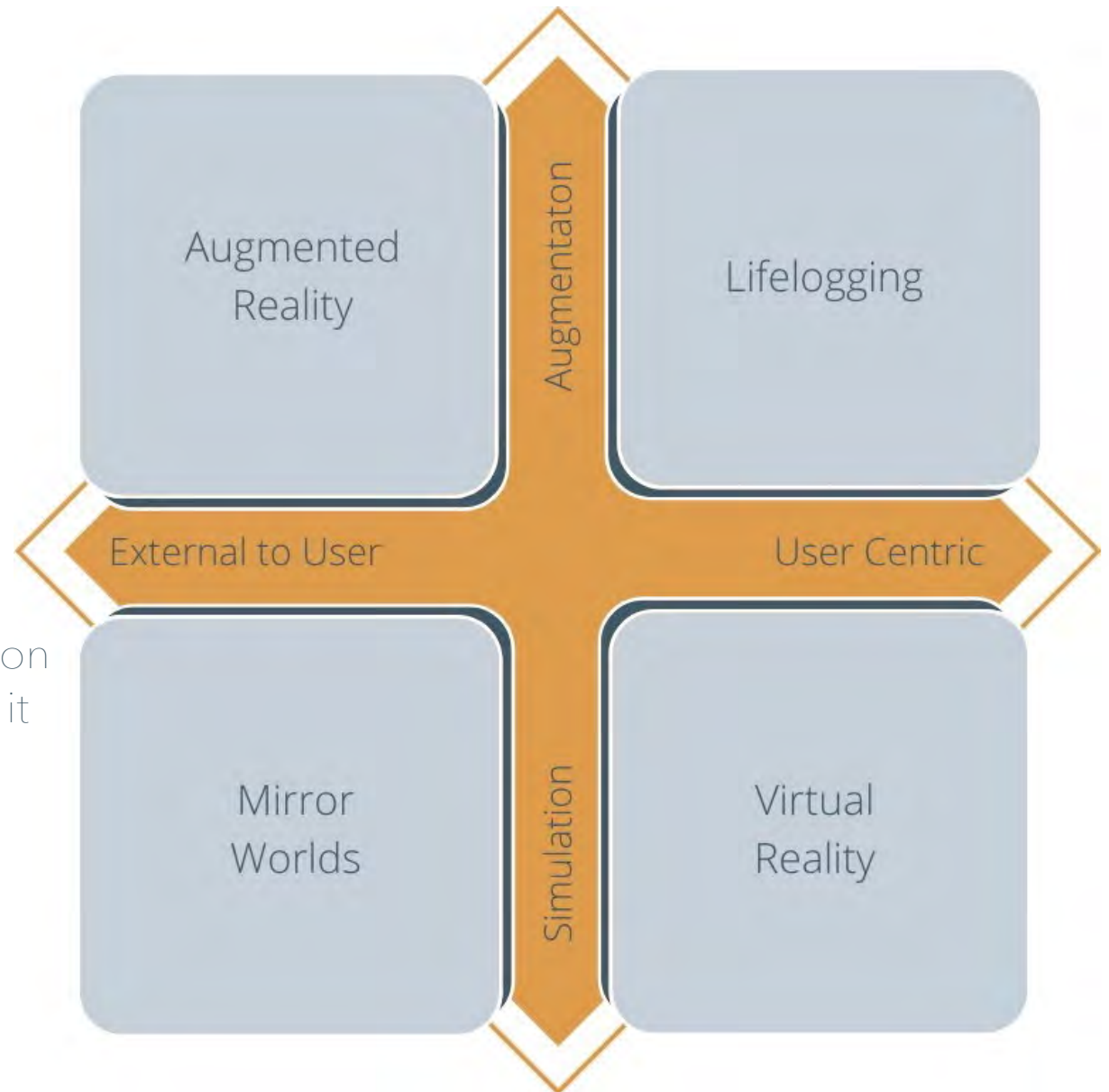**Dr. Hurriyet Ok**

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@ Facebook/REUTERS

The Metaverse is…

…the convergence of

1) virtually enhanced physical reality and

2) physically persistent virtual space. It is a fusion of both while allowing users to experience it as either

	Augmentaton	
Augmented Reality		Lifelogging
External to User		User Centric
Mirror Worlds		Virtual Reality
	Simulation	

Adopted from Smart, E.J., Cascio, J., and Paffendorf, J., Metaverse Roadmap Overview, 2007

https://www.metaverseroadmap.org/overview/

What is a Metaverse?

Gartner expects that by 2026, 25% of people will spend at least one hour a day in the Metaverse for work, shopping, education, social media and/or entertainment.

Source: https://www.gartner.com/en/articles/what-is-a-metaverse-

What is a Metaverse?

- A collective virtual space, created by the convergence of virtually enhanced physical and digital reality.

- Device-independent and is not owned by a single vendor.

- An independent virtual economy, enabled by digital currencies and **nonfungible tokens (NFTs).**

Source: https://www.gartner.com/en/articles/what-is-a-metaverse-

What is a Metaverse?

- A Metaverse represents a combinatorial innovation, as it requires multiple technologies and trends to function.

- Contributing tech capabilities include:
  - ✓ Augmented reality (AR)
  - ✓ Flexible work styles
  - ✓ Head-mounted displays (HMDs)
  - ✓ AR cloud
  - ✓ Internet of Things (IoT)
  - ✓ 5G
  - ✓ **Artificial intelligence (AI)** and spatial technologies.

What is a Metaverse?

- To understand the concepts of a Metaverse, think of it as the next version of the Internet, which started as individual bulletin boards and independent online destinations.

- Eventually these destinations became sites on a virtual shared space — similar to how a Metaverse will develop.

Why is there hype around Metaverse?

A lot of excitement around Metaverse, much of it driven by technology companies preemptively claiming to be Metaverse companies, or creating Metaverses to enhance or augment the digital and physical realities of people.
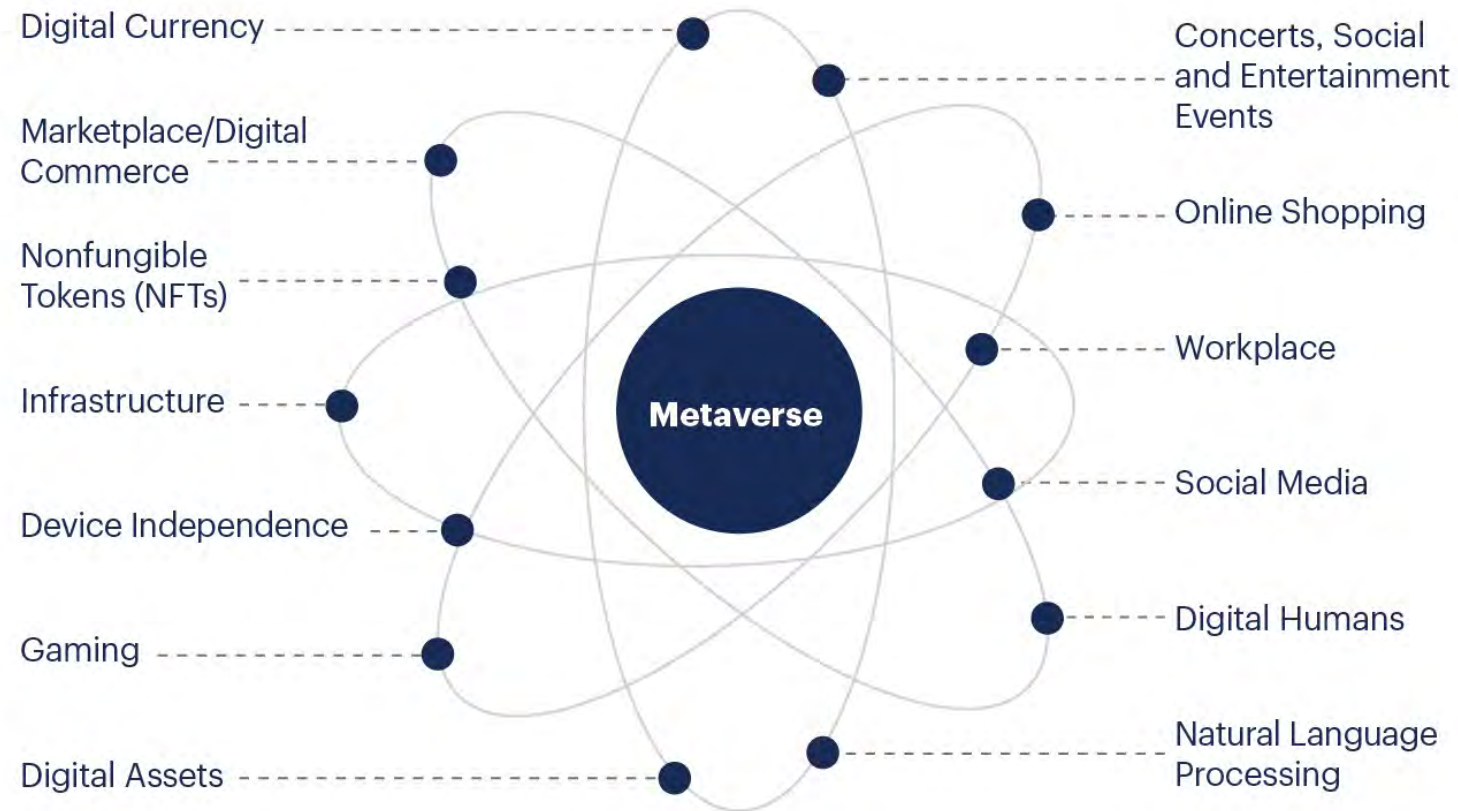
Why is there hype around Metaverse?

Activities that currently take place in siloed environments will eventually take place in a single Metaverse, such as:

- Purchasing outfits and accessories for online avatars
- Buying digital land and constructing virtual homes
- Participating in a virtual social experience
- Shopping in virtual malls via immersive commerce
- Using virtual classrooms to experience immersive learning
- Buying digital art, collectibles and assets (NFTs)
- Interacting with digital humans for onboarding employees, customer service, sales and other business interactions

Why is there hype around Metaverse?

It is expected that a Metaverse will provide persistent, decentralized, collaborative and interoperable opportunities and business models that will enable organizations to extend **digital business**.

Elements of a Metaverse

Digital Currency

Marketplace/Digital Commerce

Nonfungible Tokens (NFTs)

Infrastructure

Device Independence

Gaming

Digital Assets

Metaverse

Concerts, Social and Entertainment Events

Online Shopping

Workplace

Social Media

Digital Humans
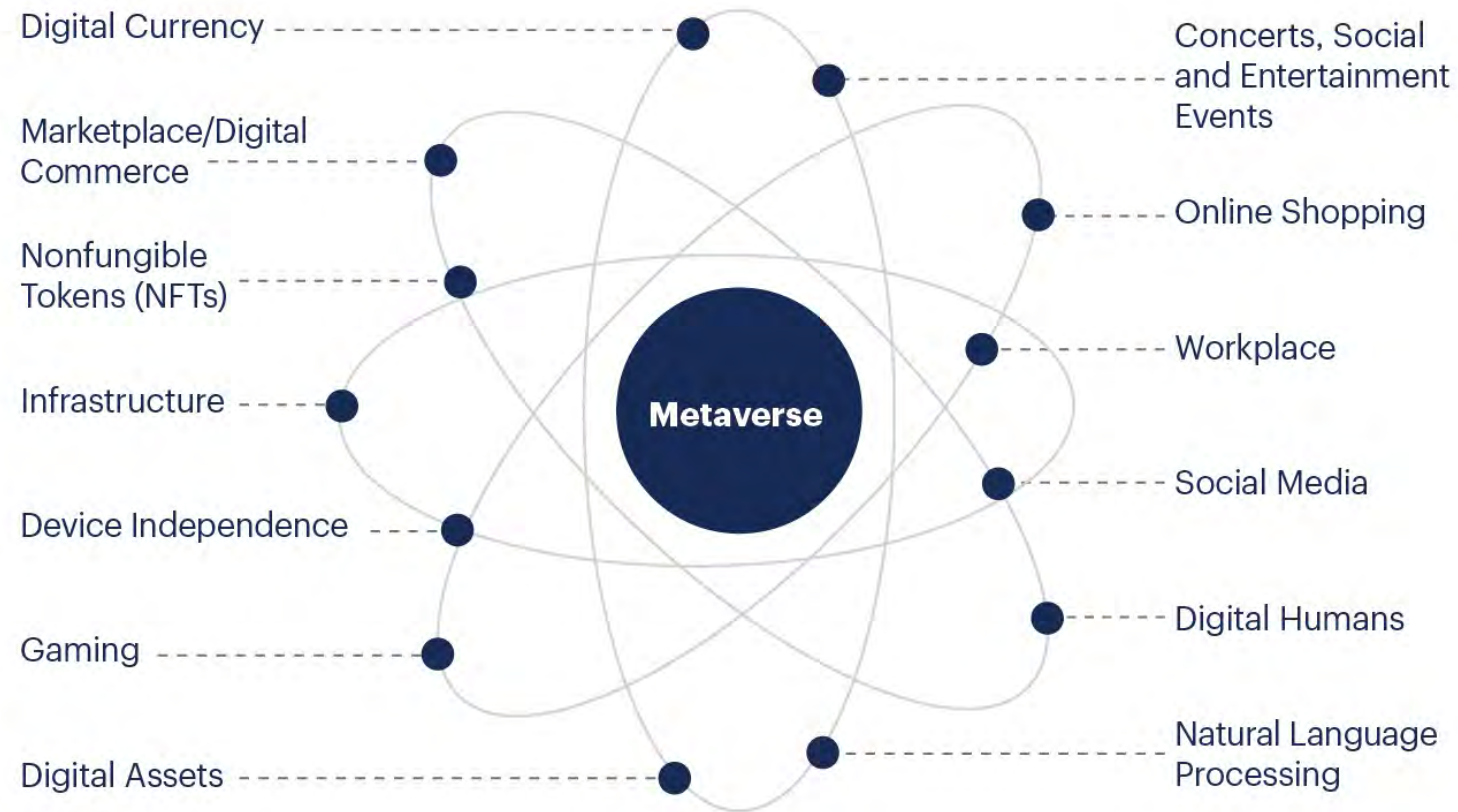
Natural Language Processing

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What is the hype or promise?

Elements of a Metaverse

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What is available and offered for consumers or customers today?

11

What are the business opportunities of a Metaverse?

Today there are many individual use cases and products, all creating their own versions of a Metaverse. Opportunities across multiple industries include:

- Higher education, medical, military and other types of trades can deliver a more immersive learning experience. They don't need to create their own infrastructure, as the Metaverse will provide the framework.

- Virtual events, having gained popularity over the last two years, can now present more integrated offerings.

- Retail can extend its reach to an immersive shopping experience that allows for more complex products.

- Enterprises can achieve better engagement, **collaboration and connection with their employees** through virtually augmented workspaces.

- Social media can move to the Metaverse, where users can interact through three-dimensional avatars.

Digital Human

https://www.unrealengine.com/en-US/digital-humans

Gartner's View on Metaverse

- The adoption of Metaverse technologies is still nascent and fragmented.

- Refrain from heavy investments in a specific Metaverse.

- It is still too early to determine which investments will be viable in the long term.

- The priority should be to learn, explore and prepare for a Metaverse without going overboard with implementation, based on a few use cases.

Recommendations for technology innovation leaders

- Develop digital business strategies that leverage the built-in infrastructure and participants of the Metaverse.

- Lead idea and innovation management that focuses on new opportunities and business models with the Metaverse.

- Identify the unique technology risk, privacy and security implications in this new persistent and decentralized environment.

- List the outcomes, opportunities and obstacles the Metaverse entails in the form of an emerging-technology wheel.

Metaverse Market Map

GW SCHOOL OF ENGINEERING

V6.1 – November 2021 - Building the Metaverse
Jon Radoff