

# From Sci-Fi to Science: Exploring the Boundaries of the Possible

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# Workshop Agenda

- From Sci-Fi to Science: Our Journey Begins
- When is it possible? A Framework
- Case Study: A Deep Dive into *Horizon Zero Dawn* (Group Work)
  - My Turn: Input and Material
  - Your Turn: Collaboration & Presenting your Findings
- Wrapping up: Takeaways & Handout



# Who am I & why am I doing this?

- My background:
  - Trained as an Engineer, with a passion for storytelling
  - .Journalist and Editor, specializing in video games.
- My current work:
  - Research and teaching in Game Studies, Film Psychology, and Film Analysis.
  - I also teach research methods, focusing on topics like Content Analysis.
- Why I'm here:
  - I pulled the shortest straw to lead this workshop. 😊



# Introduction & Examples

But wait: From Sci-Fi to Science ... like *Star Trek*?

- „gold standard“ for the idea „from Sci-Fi to Science“, using technologies in the 1960s that appeared futuristic such as:
  - Tablet Computers
  - Hyposprays
  - Teleconferencing
  - ... and even GPS (see [here](#) for a comprehensive list or check this [video](#) or videos of [Metin Tolan](#))
- Here's the key: **Most technologies were not original inventions** of the show's writers. Instead, they were visualisations of ideas already circulating in research labs and among visionaries.
- Star Trek acted as a catalyst for imagination. It didn't just show us what might be possible—it inspired a generation to make it possible.

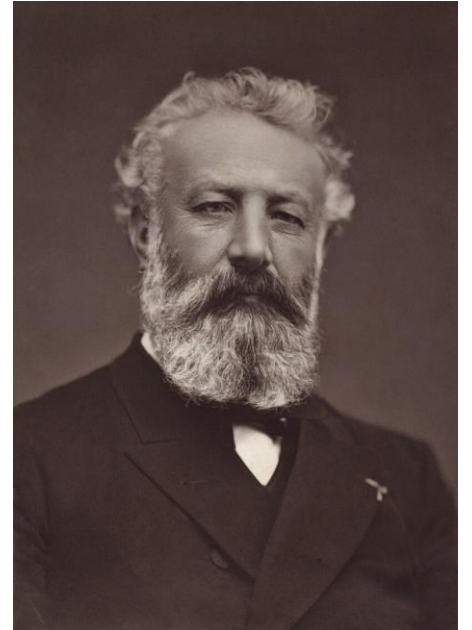




# Our Journey Begins

## Jules Verne: The visionary Thinker

- A visionary and one of the founders of science fiction. (He actually referred to his novels as "scientific romances.")
- He made some remarkably accurate predictions:
  - Launching spaceships from near the equator (From the Earth to the Moon, 1865)
  - The electric submarine Nautilus (Twenty Thousand Leagues Under the Sea, 1869-70)
- And some very memorable mistakes:
  - Using a giant cannon to launch spaceships into space (From the Earth to the Moon, 1865)
  - The pursuit of unlimited energy (Twenty Thousand Leagues Under the Sea, 1869-70)
- His true talent was his **visionary thinking**: the capacity to **extrapolate from existing knowledge** and understand human nature to **truly push the envelope**.

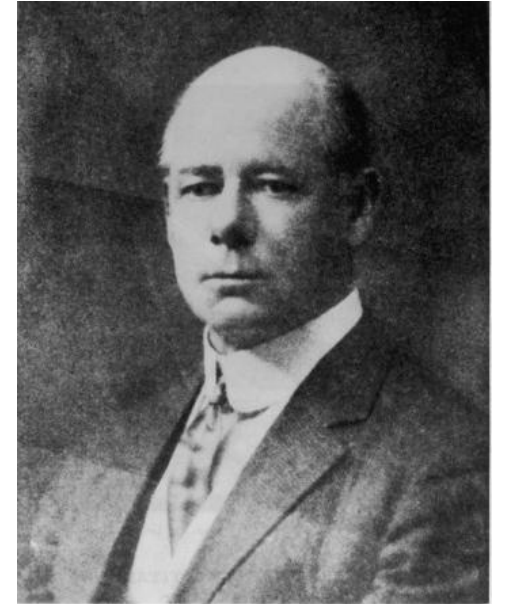




# Our Journey Begins

## Morgan Robertson: The Prophetic Sailor

- In 1898, he published the novella *Futility, or the Wreck of the Titan*.
- The plot sounds eerily familiar:
  - The largest and fastest ocean liner in the world, deemed "unsinkable," strikes an iceberg in April in the North Atlantic.
  - The ship sinks, and most passengers perish due to a severe lack of lifeboats.
- **This was published 14 years before the *Titanic* disaster!**
- How did he "predict" this? 😊
  - A. Precognition
  - B. Clairvoyance
  - C. A seasoned mariner with extensive knowledge of shipbuilding and maritime trends





# Our Journey Begins

## Bill Gates: The Tech Titan Who Saw the Future

- He needs no introduction. But what's less known is how prescient his 1999 book, **Business @ the Speed of Thought**, truly was.
- In it, he made a number of **remarkable predictions** that became reality:
  - The **proliferation of mobile devices**
  - The **emergence of social media**
  - **Personalized advertising**
  - **AI-powered personal assistants**
- His vision was a unique combination of:
  - **Deep expertise and visionary ideas** and his **direct influence and control** over the future of technology, as his company actively worked to bring these concepts to life.





# Our Journey Begins

## Three Types of Visionaries: The Extrapolators

- Our journey has revealed three types of visionaries:
  - **The Extrapolator of Imagination:** Jules Verne was no expert, but a well-read and creative mind. His visions led to some hits, but also many misses.
  - **The Extrapolator of Expertise:** Morgan Robertson's deep knowledge and logical inference resulted in a chillingly precise hit.
  - **The Extrapolator of Power:** Bill Gates combined expertise and strategy, leading to many hits because he had the power to influence their creation.
- This shows that the line between science fiction and science isn't static—it's often a matter of perspective, defined by the knowledge gap between experts and the general public.



**Where do we fit in? As researchers, we are clearly not experts in engineering or computer science. So what is our role in this process?**







# When it is possible? A Framework

## How to evaluate the **boundaries of the possible**?

- We can categorize possibilities by different views:
  - **Theoretical Possibilities:** Possible in principle, but lacking practical application.
  - **Practical Possibilities:** Possible, but too expensive or inefficient to be useful.
  - **Undesired Possibilities:** Technically possible, but socially or ethically unwanted.
  - **Forbidden Possibilities:** Possible, but restricted by law or norms.
- Other perspectives to consider:
  - **Accidental Possibilities:** Sometimes possibilities are discovered by serendipity (e.g., penicillin).
  - **Context-Dependent Possibilities:** Possible only in specific settings (e.g., labs, specific societies, with extreme resources).
  - **Fictional Possibilities:** Existing only in imagination and stories... for now.



# When it is possible? A Framework

## A More Practical Framework: The "When" Question

- The previous framework might seem a bit abstract. So let's focus on one key question:  
**When is a technology possible?**
- In your groups, please place each technology into one of the following categories. Don't worry about being perfect—there are no wrong answers. The goal is to start a discussion.

Possible Today	Technically possible, but not yet widely used due to cost, regulations, or lack of demand.
Possible in 50 Years	The underlying science and engineering exist, but we still need significant R&D to make it viable.
Possible with a Breakthrough	Requires a fundamental scientific breakthrough that we can't yet predict.
Impossible	According to our current understanding of physics and science.





## When it is possible? A Framework

- Teleportation of macroscopic objects (including human beings)
- Extend possible lifespan of human beings to 150 years
- Flying Cars/Air Taxis for short distance
- Medical Nanobot repairing blood vessels, destroying cancer cells
- Colonization of other Planets, e.g., Mars

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Flying Cars				
Medical Nanobots				
Space Colonization				

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# When it is possible? A Framework

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Teleportation				X
Extend Lifespan			X	
Flying Cars	X			
Medical Nanobots		X		
Space Colonization		X		

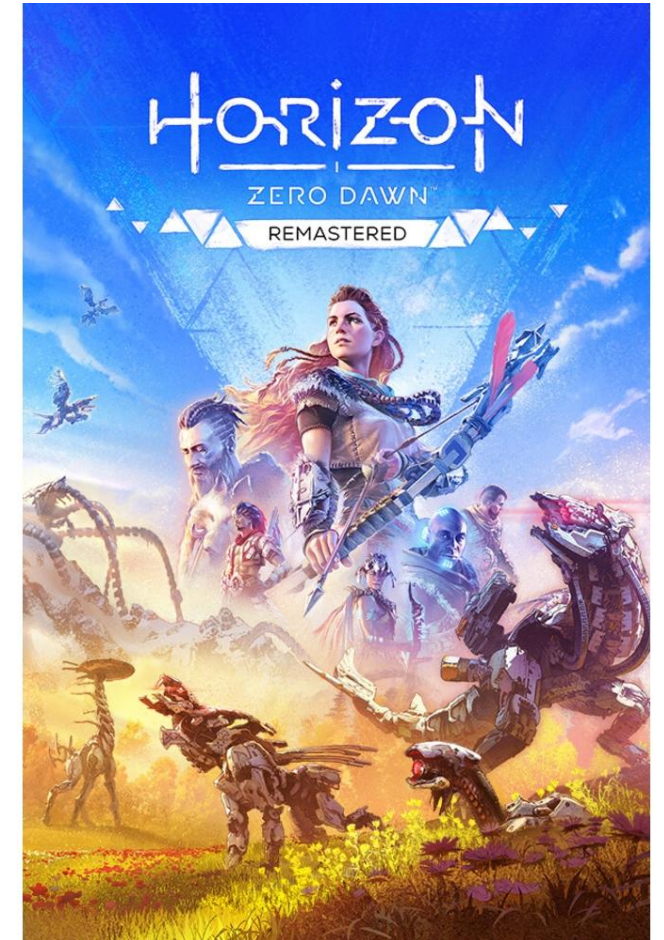
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# Case Study: A Deep Dive into *Horizon Zero Dawn*

## Horizon Zero Dawn: Fact Sheet

- Developer: Guerrilla Games / Sony Interactive Entertainment
- Original Released: 2017 (PS4)
- Ratings: Metacritic: 89/100 (PS4) | OpenCritic: 94%
- Sales: Sold more than 24.3 Mio. units (as of April 2023)
- Acclaim: Highly praised for its engaging gameplay, immersive world, and captivating story
- Lets watch the E3-Trailer (2016)







# Case Study: Horizon Zero Dawn

## Horizon Zero Dawn: Background Story

- The game's environmental storytelling induces curiosity and raises the central question:
- **What happened to humanity?**
- Lets watch a short video outline





## Case Study: Horizon Zero Dawn

### Group Task: Analyzing the Technology

- In your groups, read the provided text and identify the key technologies mentioned.
- Using your mobile devices, Handhelds, Laptops, do some quick research on these technologies.
- Then, fill out the provided table for each technology: Based on your findings, decide where the technology would fall on our framework of possibility.
- Note: You can either aim for a comprehensive overview or focus on just a few technologies and go into more detail. The choice is yours.
- Materials: Pre-Story Horizon Zero Dawn, Table\_Header
- Time: 15 Minutes





# Case Study: Horizon Zero Dawn

## Results

- The analysis clearly shows that the fiction of HORIZON ZERO DAWN isn't created from scratch; instead, it's built on real-world technological trends.
- The "gap to fiction" almost always consists of three things:
  - **Scaling:** The technology is real, but only feasible on a small scale.
  - **Autonomy:** Today's systems can't yet operate without human control.
  - **Social/Ethical Context:** The biggest hurdles aren't technical, but rather political, economic, and ethical.
- sample solution can be downloaded in the Download Portal later today



## Wrapping up: Takeaways

### Now, let's talk about the process:

- How did you approach the research?
  - **What kind of information** did you look for? (e.g., scientific papers, news articles, company websites)
  - **Who** did you trust as an authority on the topic? (e.g., academic institutions, tech companies, journalists)
  - What were the **major challenges** in finding reliable information?
- **Were there any surprises?** Did your initial assessment change after your research?
- For you: Handout *How to Assess the Plausibility of a Sci-Fi Technology* (Material)



## Wrapping up: Takeaways

- The methodology we applied to sci-fi is a powerful tool for your own research.
- Before you analyze the effects, analyze the content:
  - **Step 1:** Scrutinize the "Source." Don't just accept claims at face value. Investigate their origin and underlying interests.
  - **Step 2:** Understand the "Background." Research the real-world precursors and the context in which the phenomenon emerged.
  - **Step 3:** Map the "Possibility." Use a framework to systematically evaluate the phenomenon's components and underlying assumptions.
- **Example:**
  - **Problem:** How does the stereotypical portrayal of bullying victims affect adolescents?
  - **Your Action:** First, analyze how bullying victims are portrayed in media. Where does this portrayal come from? What are its real-world antecedents?

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# Thank you for your participation!

Feedback is appreciated, contact me 😊

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