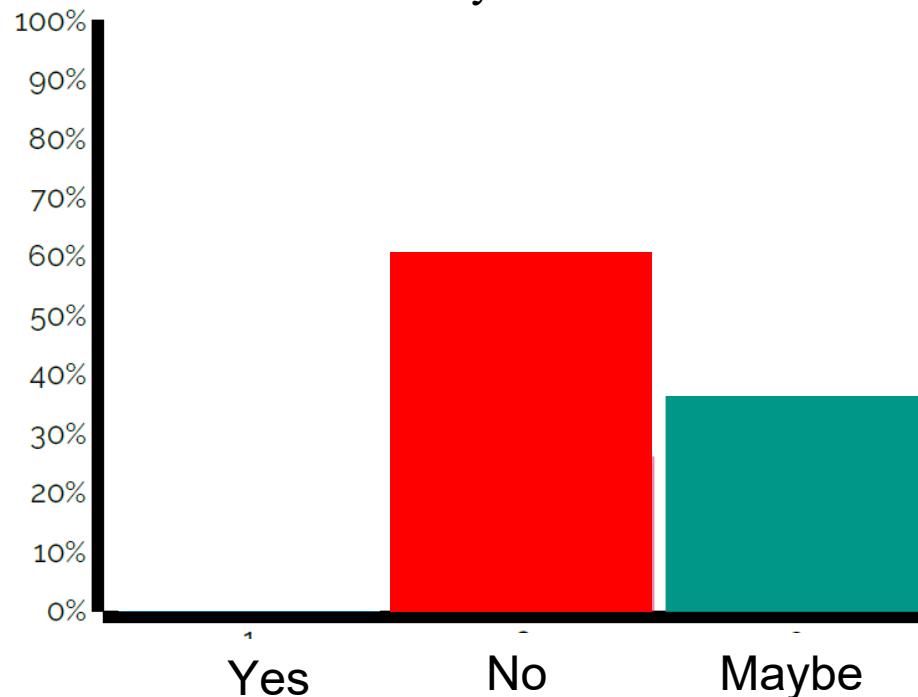


Engineering, Ethics and Society: Computing Ethics 1- Simulation and Gaming

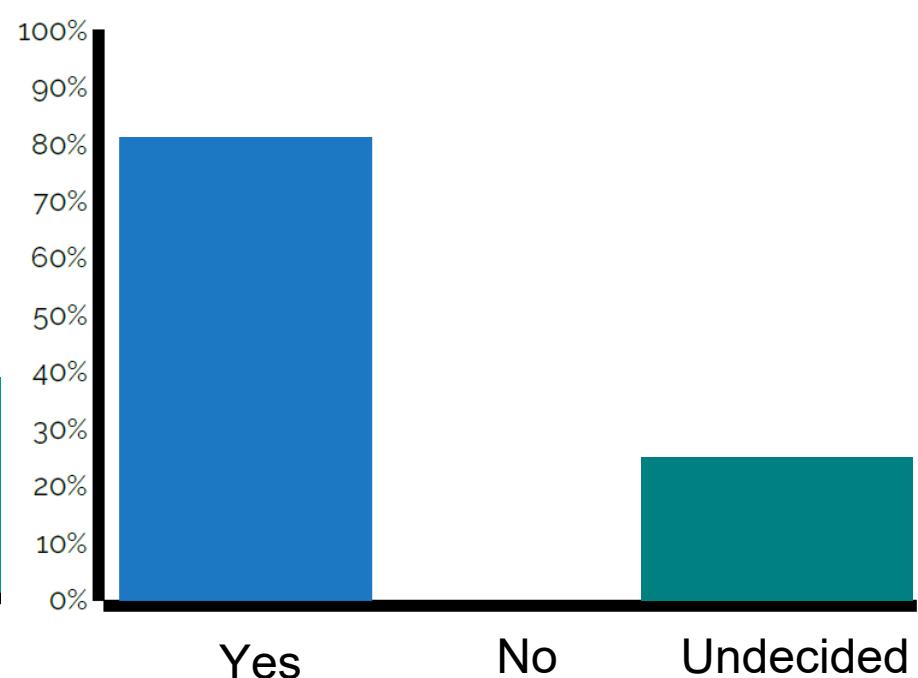
Dr. Gershon Weltman
Engineering 183EW, UCLA SEAS
Lecture 11

Previous Online Poll Results

Would you choose your children's characteristics if you could?



Do you see some value in human gene editing and replacement?



Computing Ethics Overview

Use Modality	Computing Technology			
	Simulation & Gaming	Artificial Intelligence & Robotics	Internet Connectivity	Databases & Surveillance
Personal	L	L	L	L
Societal	L	L	L	L

~~M = Medium Effect~~

L = Large Effect

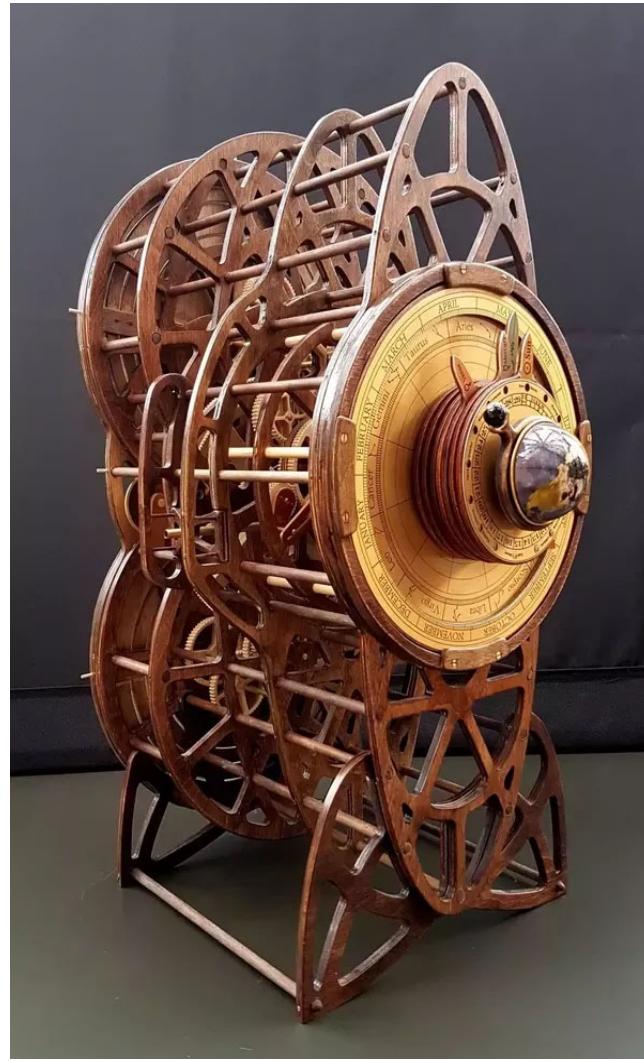
Profound Societal and Ethical Implications!

Lecture Contents

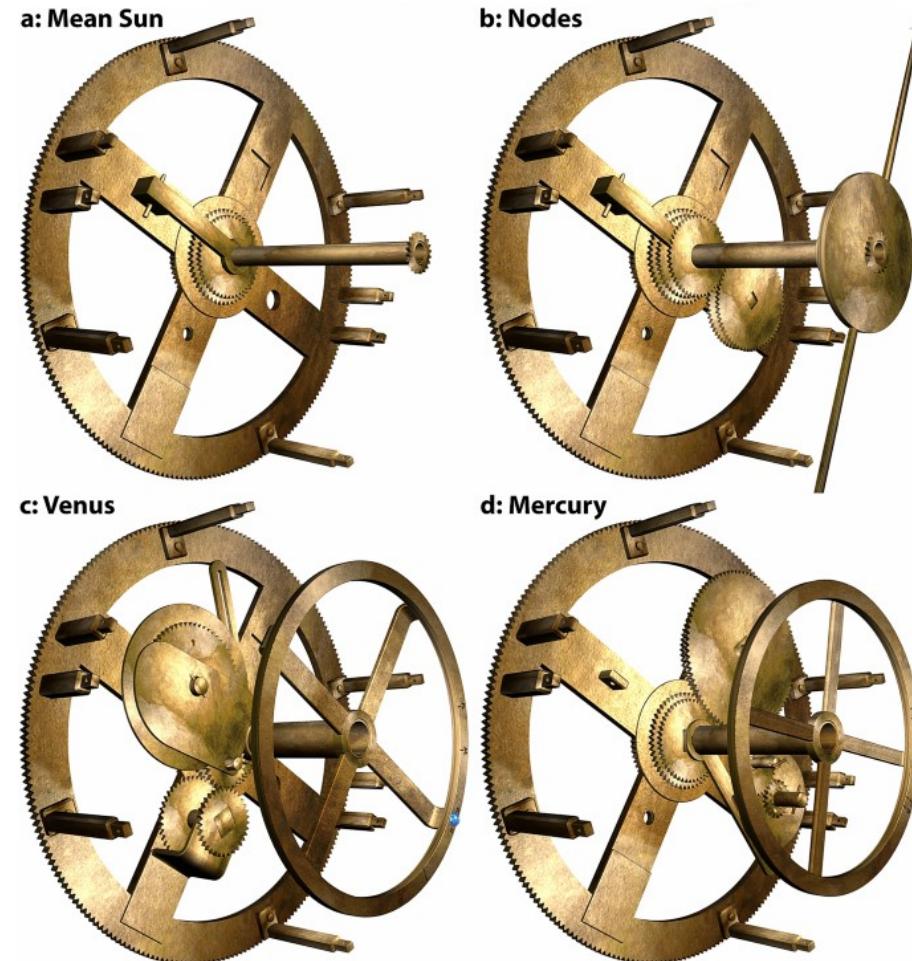
- Historical Timeline
 - Ancient Mechanisms
 - Mechanical Calculators
 - Modern Computer Configurations
 - Growth of Computing Power
- Ethical Case 1: Simulation
 - Power of Visualization
 - Basis of Transparency
 - Ethical Issues of Simulation
 - Problems of Deep Fakes
- Ethical Case 2: Gaming
 - Beginnings
 - Role Playing Implications
 - Violent Games Pros and Cons
 - Game Developers' Ethical Code
 - Game Players' Ethics and Morality
- Ethical Take-Away

Ancient Analog Computer

Antikythera Mechanism (~70-60 BCE)



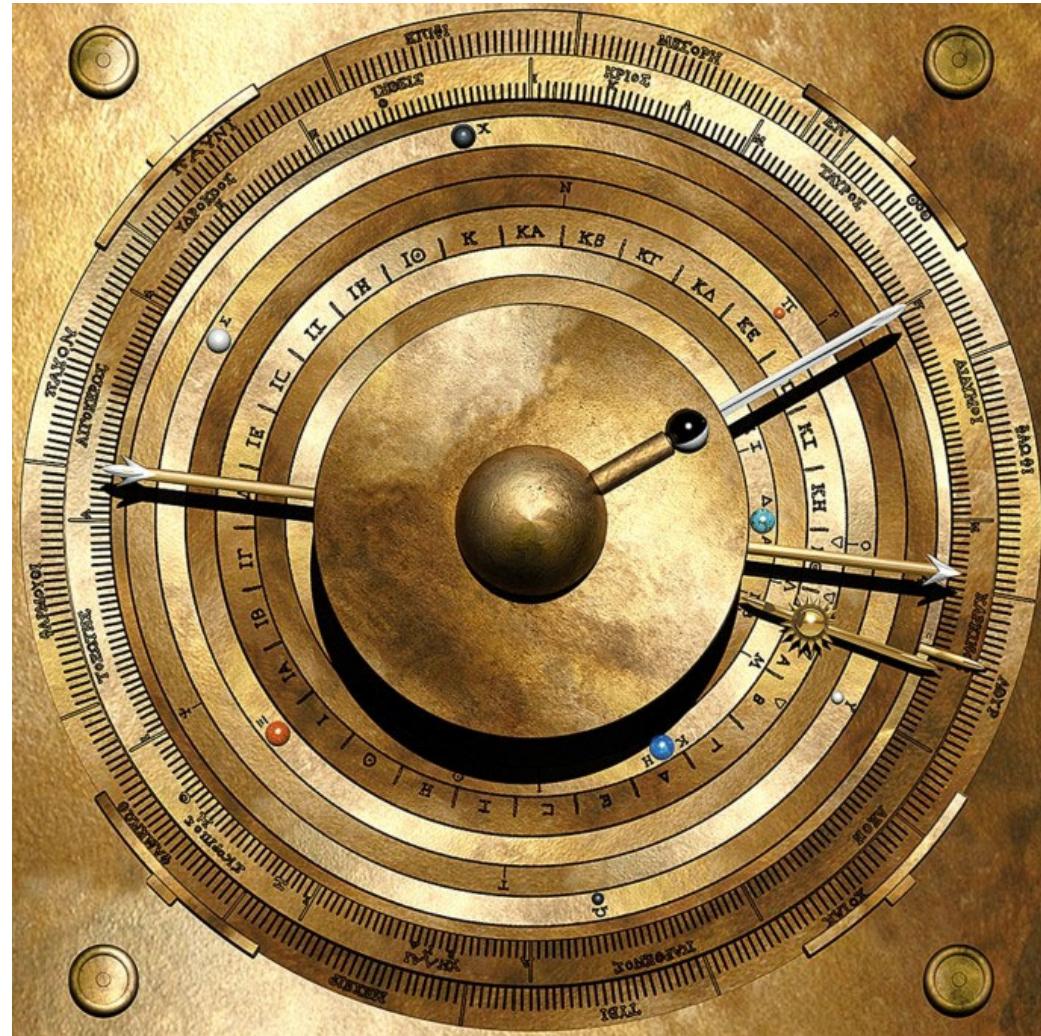
Ancient Analog Computer



<https://www.nature.com/articles/s41598-021-84310-w>

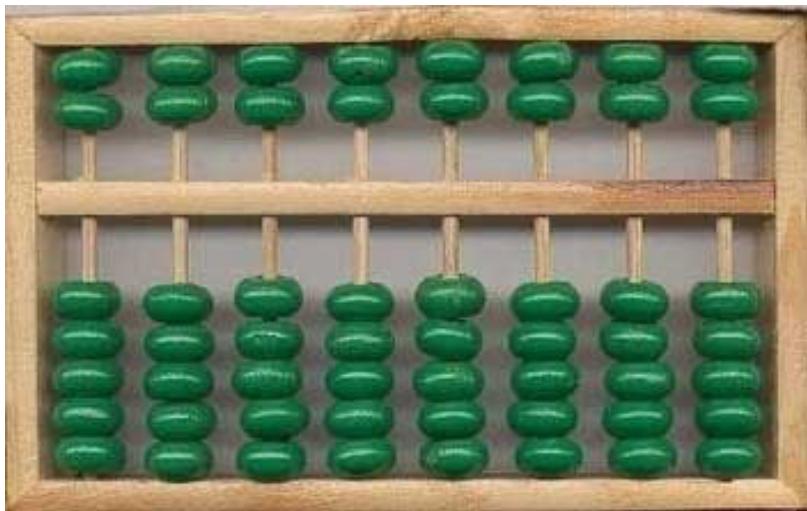
Ancient Analog Computer

"Computer model of the cosmos display. In the centre, the dome of the Earth, the phase of the Moon and its position in the Zodiac—then rings for *Mercury*, *Venus*, true *Sun*, *Mars*, *Jupiter*, *Saturn* and *Date*, with "little sphere" markers and smaller markers for oppositions. Scale marks and index letters for the synodic cycles of the planets are inscribed on the planet rings. Surrounding these, the *Zodiac* and the *Egyptian Calendar*. The true *Sun* ring has a "little golden sphere" with "pointer", as described in the BCI⁹. When the Moon and Sun pointers coincide, the Moon sphere shows black for New Moon; when the pointers are on opposite sides, the Moon sphere shows white for Full Moon."



<https://www.nature.com/articles/s41598-021-84310-w>

Ancient Digital Counting Aids



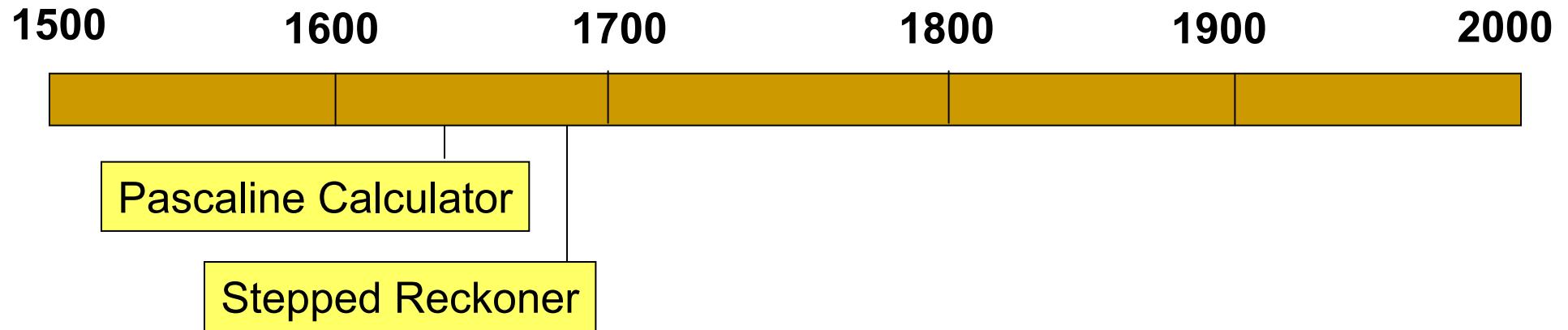
Chinese Abacus ~100 CE



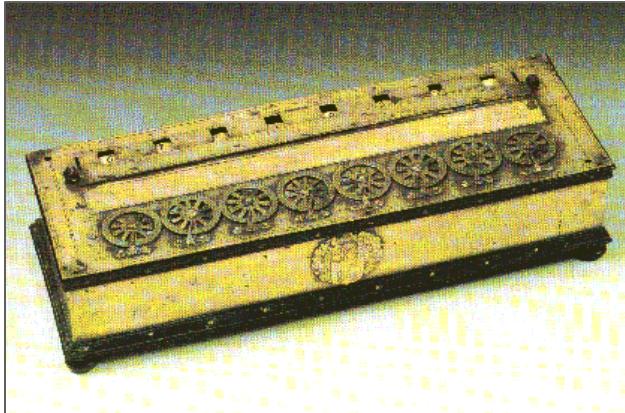
Roman Abacus ~100 CE

The abacus keeps a running count of numbers being added or subtracted; when the list is finished the total is immediately available, so a skilled abacus user is as fast as an electrical or mechanical calculator.

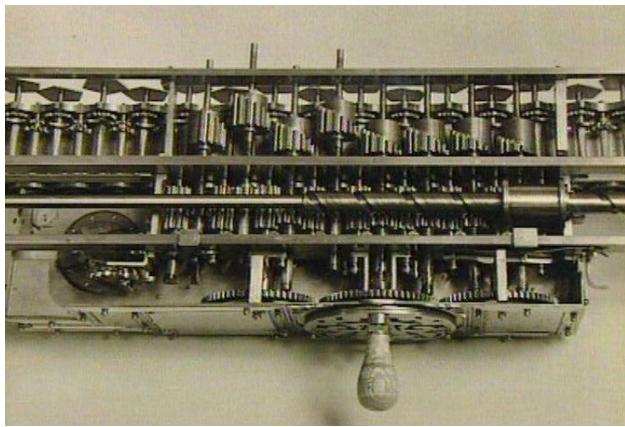
Digital Mechanical Calculators



Digital Mechanical Calculators

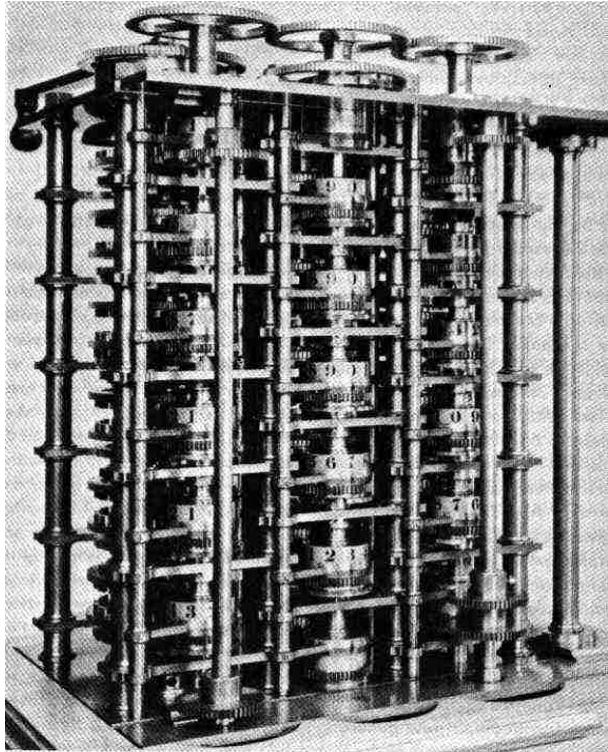


Pascaline Calculator was produced by Blaise Pascal, a French mathematician, in 1642. The device could add two decimal numbers. Pascal started production of his calculator and about 50 machines were produced, but there was no interest, so he had to stop.



The Stepped Reckoner calculator was produced by Gottfried Leibnitz, a German mathematician, in 1673. It was more complex than Pascal's machine and could perform all four basic arithmetic functions.

Computer Concepts and Mechanisms

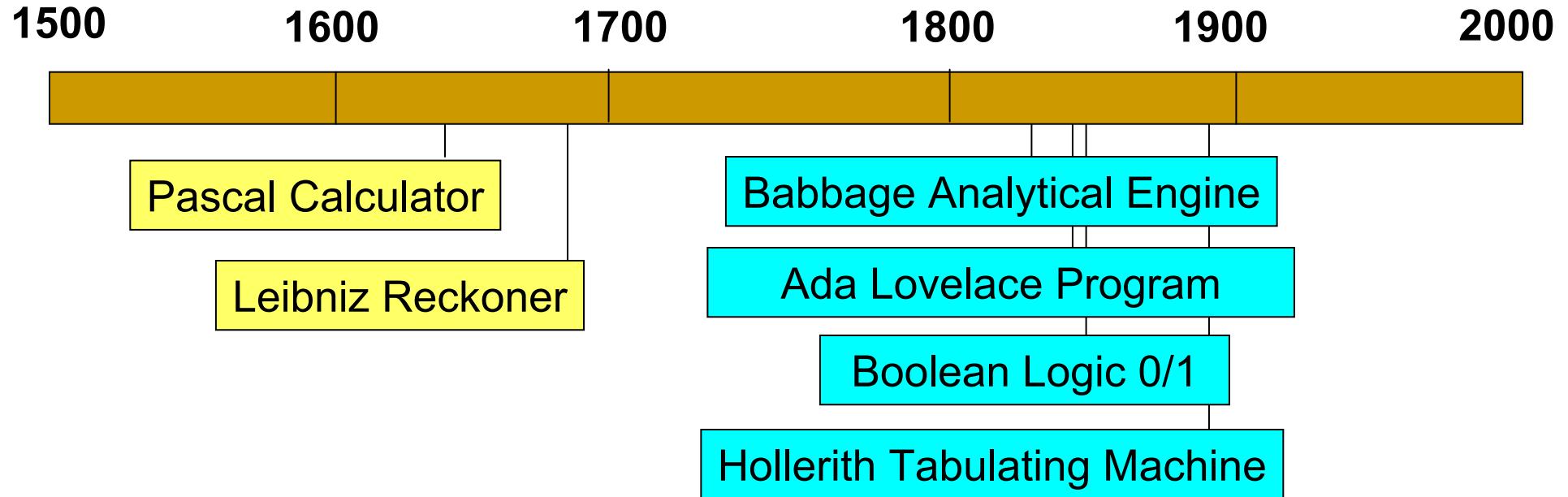


Babbage Analytical Engine

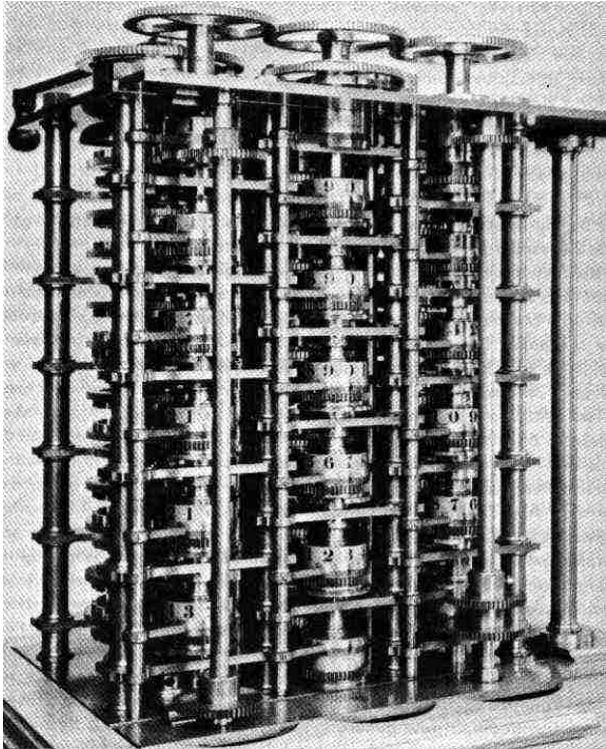
In the 1820s Charles Babbage built *Difference Engines* to compute tables of useful numbers using the difference method of polynomial approximation.

A decade later he and Ada Lovelace proposed a novel machine featuring programmed inputs and printed output; they called it an *Analytical Engine* – but it was never fully completed.

Computer Concepts and Mechanisms

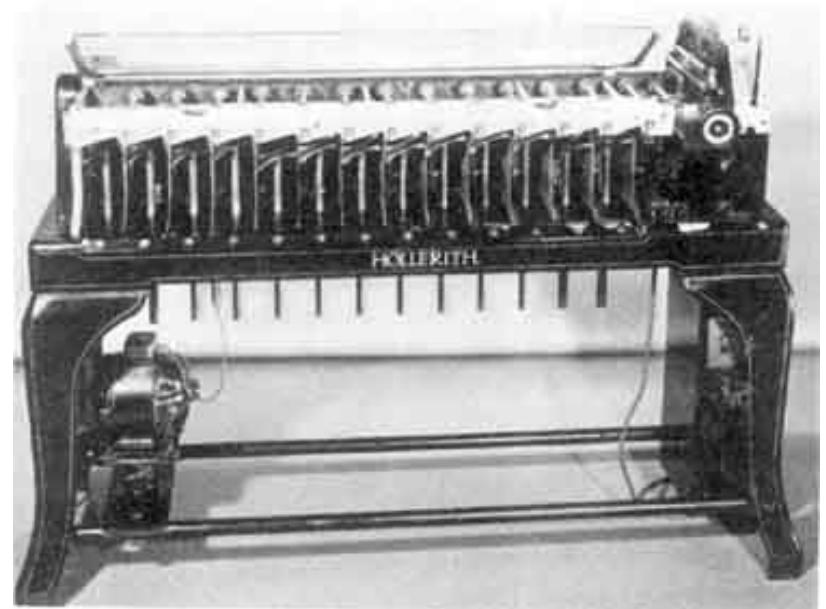


Computer Concepts and Mechanisms



Babbage Analytical Engine

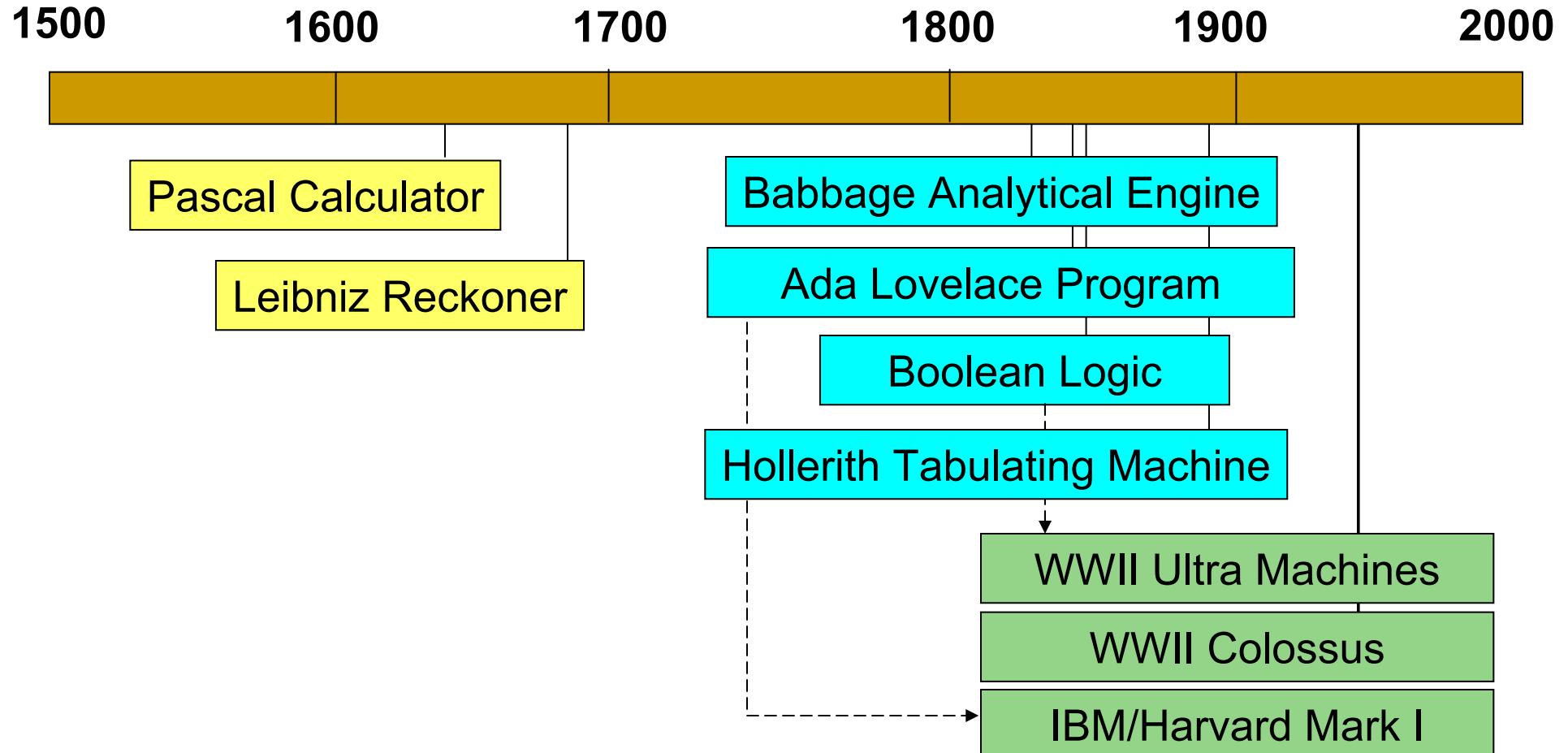
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Hollerith Tabulating Machine

The Herman Hollerith punched card tabulator compiled the 1890 census in 6 months -- 9.5 years faster than the 1880 census – and led to formation of International Business Machines (IBM).

Real Computers

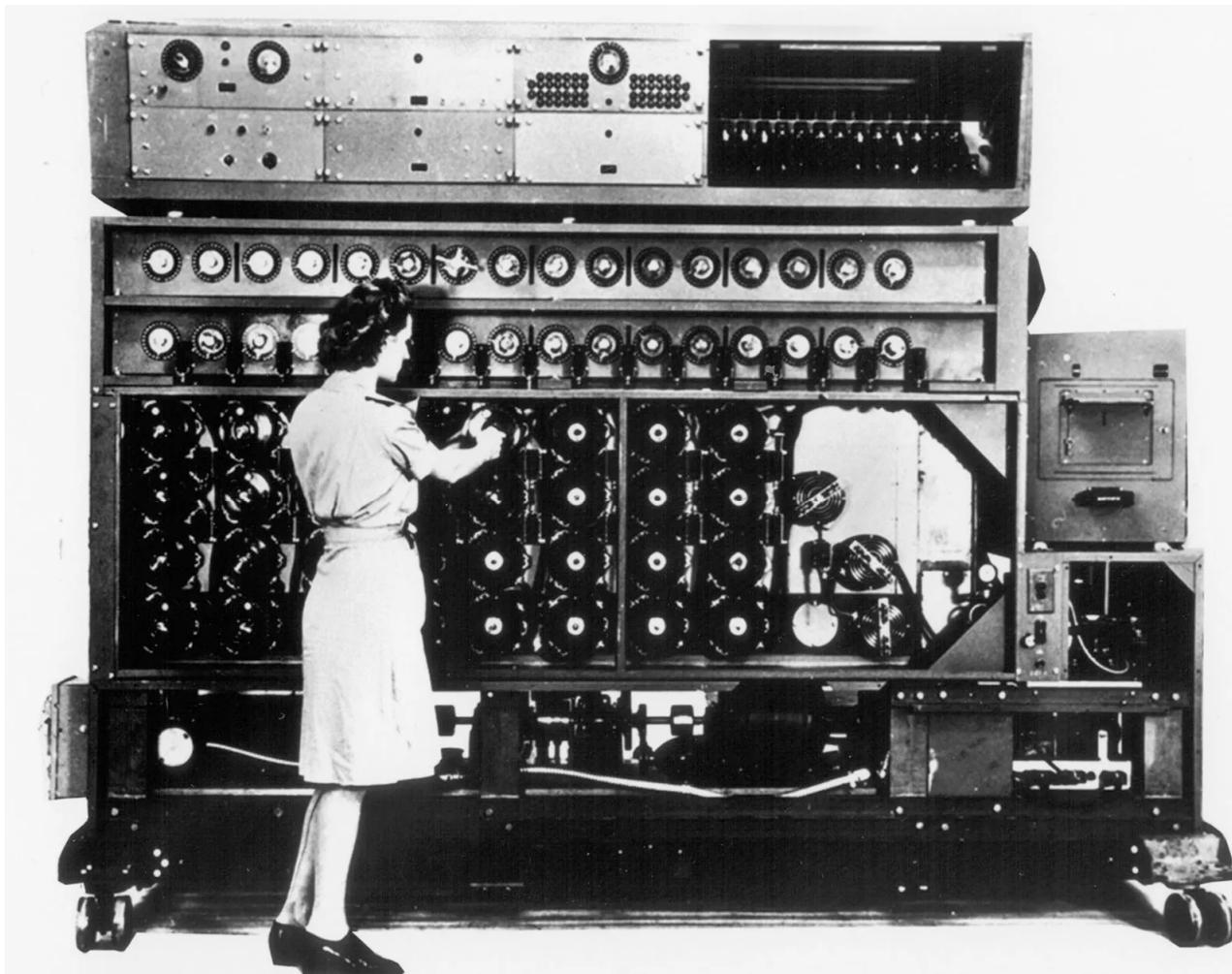


German Enigma Coding Machine



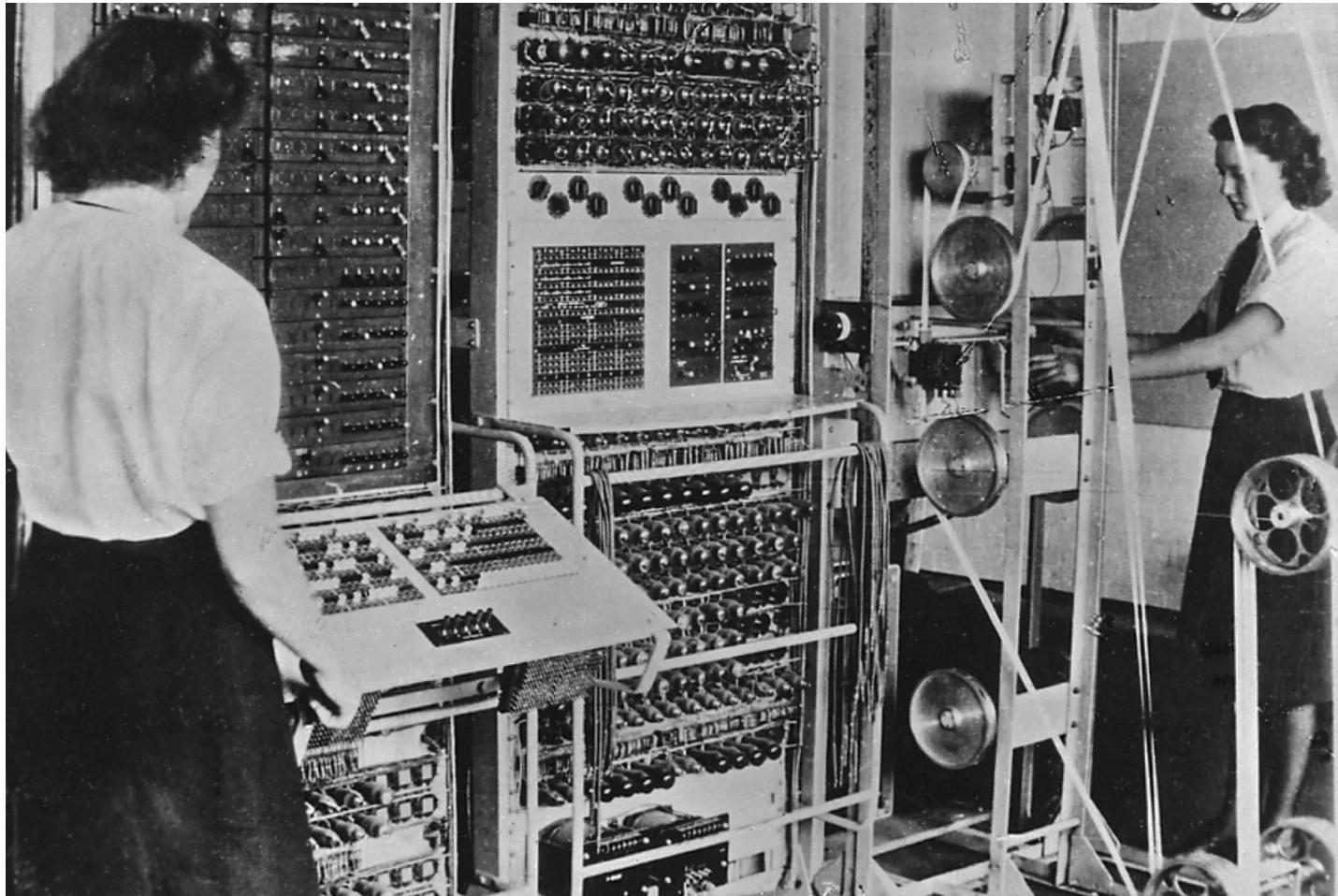
Enigma's 3 rotors scrambled the 26 letters of the alphabet with each key press. The rotor settings were changed daily, and the code was considered unbreakable.

Bombe WWII Ultra Codebreaker



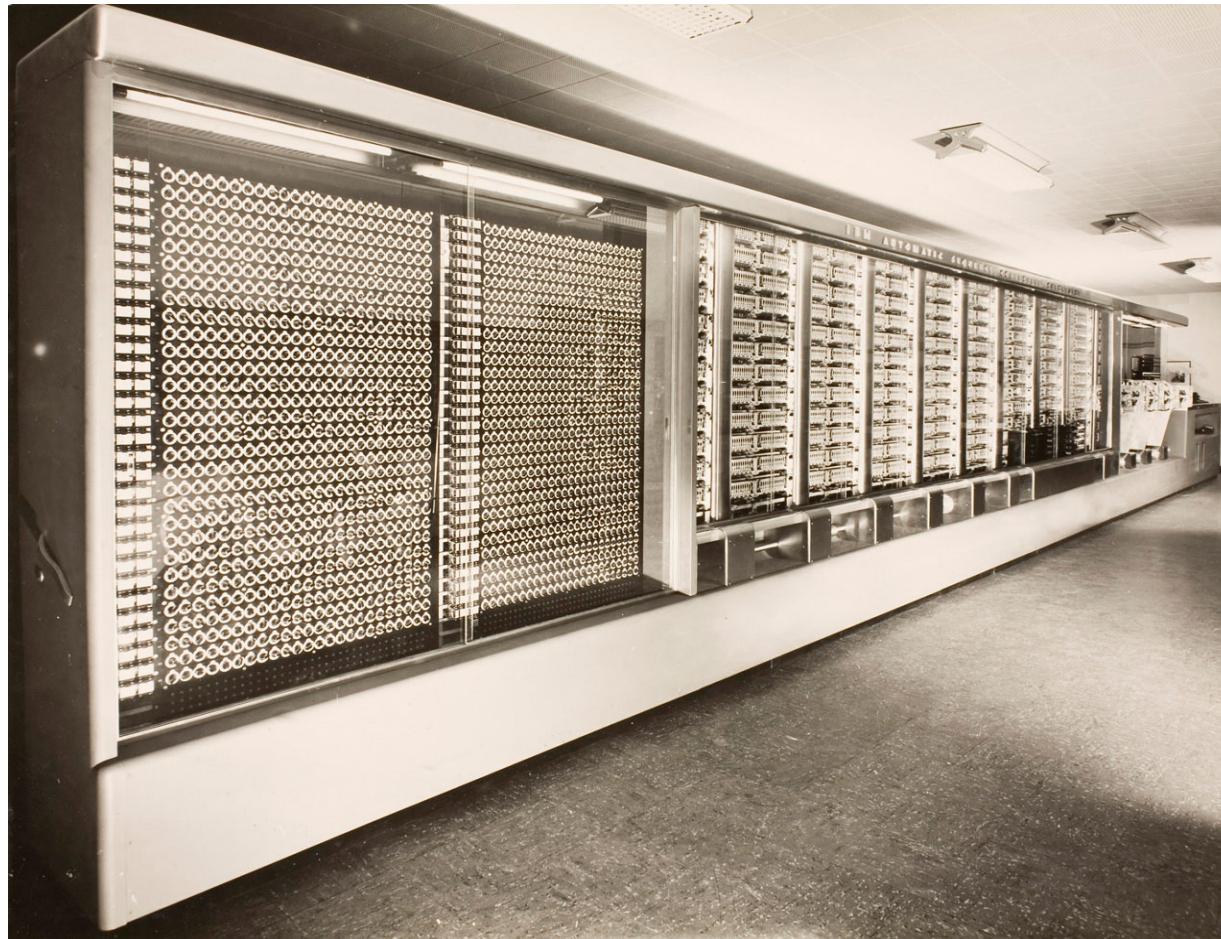
The electromechanical Bombe machine was used to break the German Enigma code

Colossus WWII Ultra Codebreaker



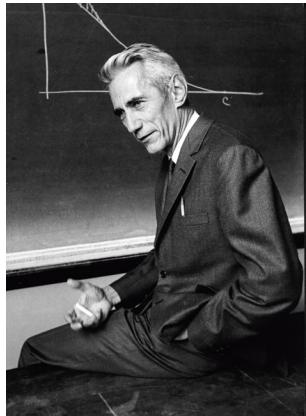
Colossus was all electronic tubes but was programmed by switches not software

IBM/Harvard Mark I Computer



The Mark I was developed by IBM from a 1937 concept by Howard Aiken based on the Babbage Analytical Engine; it was delivered to Harvard in 1944 in time for use in WWII.

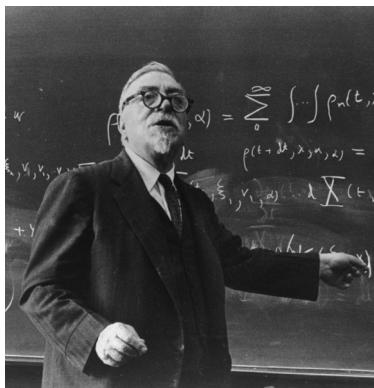
Pioneers of Information Theory



Claude Shannon, Bell Labs

“Claude Shannon defined the **quantity of information** produced by a source--for example, the quantity in a message--by a formula similar to the equation that defines thermodynamic entropy in physics. In 1948, at the very dawn of the information age, this digitizing of information of any sort was a revolutionary step. His 1948 paper may have been the **first to use the word "bit,"** short for binary digit.”

<https://www.scientificamerican.com/article/clause-e-shannon-founder/>



Norbert Wiener, MIT

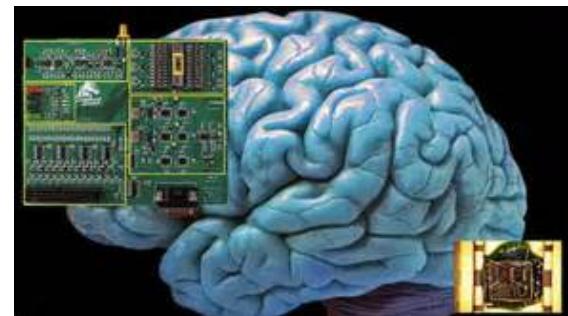
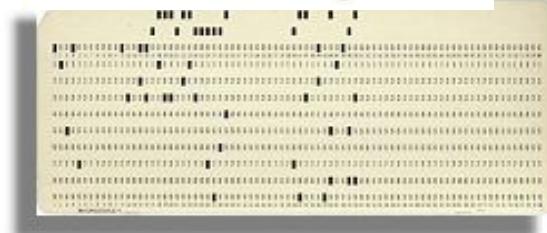
“Norbert Wiener is considered the originator of **Cybernetics**, the science of communication as it relates to living things and machines, with implications for **engineering, systems control, computer science, biology, neuroscience, philosophy**, and the organization of **society**. Norbert Wiener is credited as being one of the first to theorize that all intelligent behavior was the result of feedback mechanisms, that could possibly be simulated by machines. **This was an important early step towards the development of modern artificial intelligence.**”

https://en.wikipedia.org/wiki/Norbert_Wiener

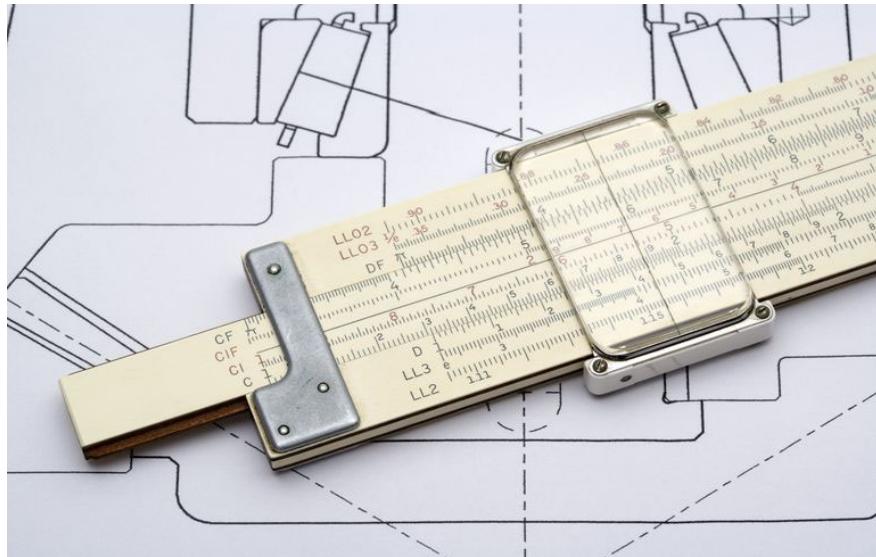
Shannon and Weiner provided the math and philosophy for the computer revolution

20th/21st Century Computing

- Desktop Tabulator
- Personal Assistants
- Vacuum Tubes
 - 1943-55 Colossus, ENIAC
 - 1955-60 IBM 704
- Transistor Semiconductors
 - 1959 IBM 7090
 - 1965 DEC PDP-8 Mini-Computer
- Integrated Circuits
 - 1968 DEC PDP-10 Mini-Computer
 - 1982-4 IBM - Apple PCs
 - 1993 Pentium™ Laptop
 - 2003 PowerMac™ G5
 - 2008 Intel Core™ 2 Duo
 - 2011 IBM z196, Intel Core i7 980x
 - 2014 IBM et al TrueNorth (5.4B)
 - 2020+ Extension and Expansion
- New Directions



20th Century Personal Assistants I

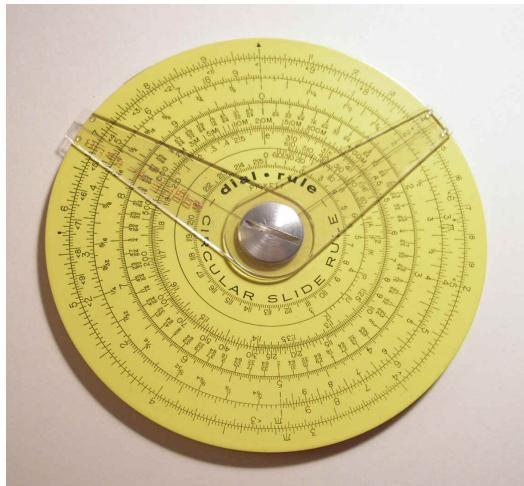


Ubiquitous Slide Rule

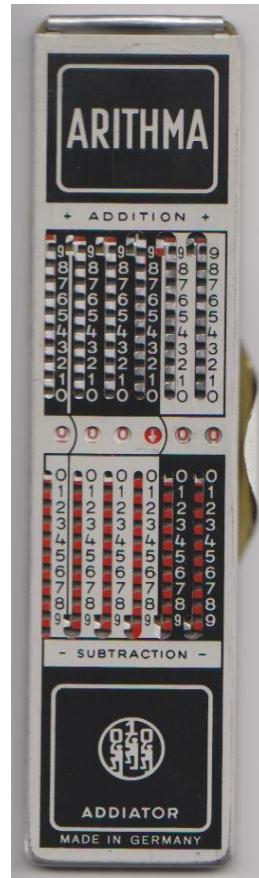


Stereotypical Engineer

20th Century Personnel Assistants II



Circular Slide Rule



Pocket Calculator



Electronic Calculator

Early Configurations: The SAGE Computer

The SAGE network of computer systems was designed in the 1950's to detect and defend from incoming bombers. It became operational in the early 1960's and remained operational until the early 1980's.



Each SAGE computer complex had about 50,000 vacuum tubes taking up 40,000 square feet and consuming *3 million watts of power*.

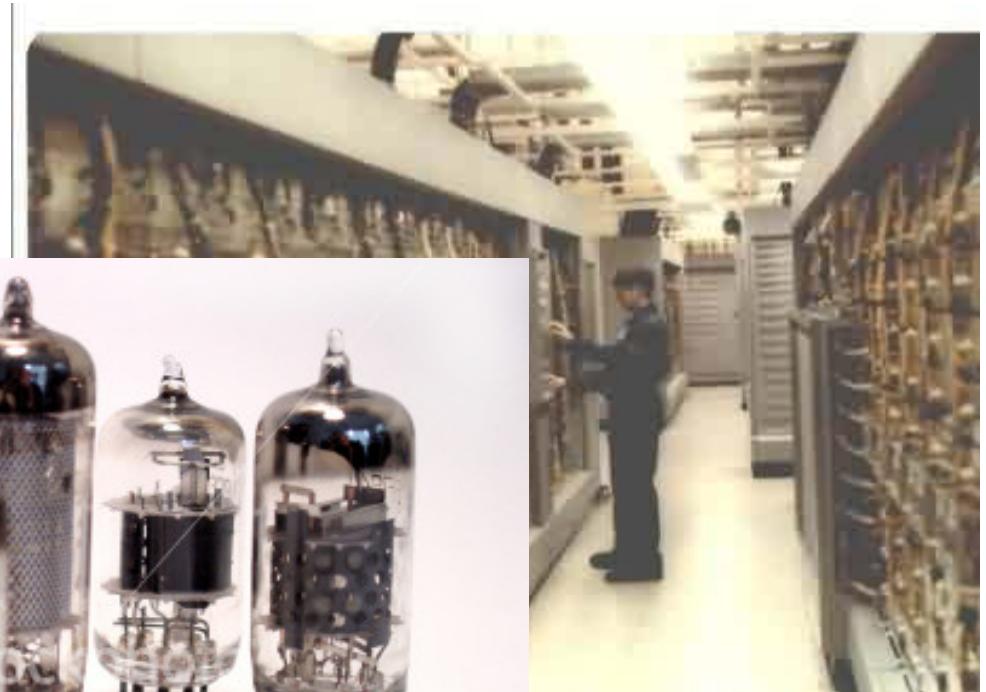
<http://www.thegalleryofoldiron.com/SAGE.HTM>

Early Configurations: The SAGE Computer

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Vacuum Tubes



Each SAGE computer complex had about 50,000 vacuum tubes taking up 40,000 square feet and consuming 3 million watts of power.

First Mini-Computer: Bendix G-15



BENDIX G-15 COMPUTER

SEAS' first standalone computer gave students access to software and hardware

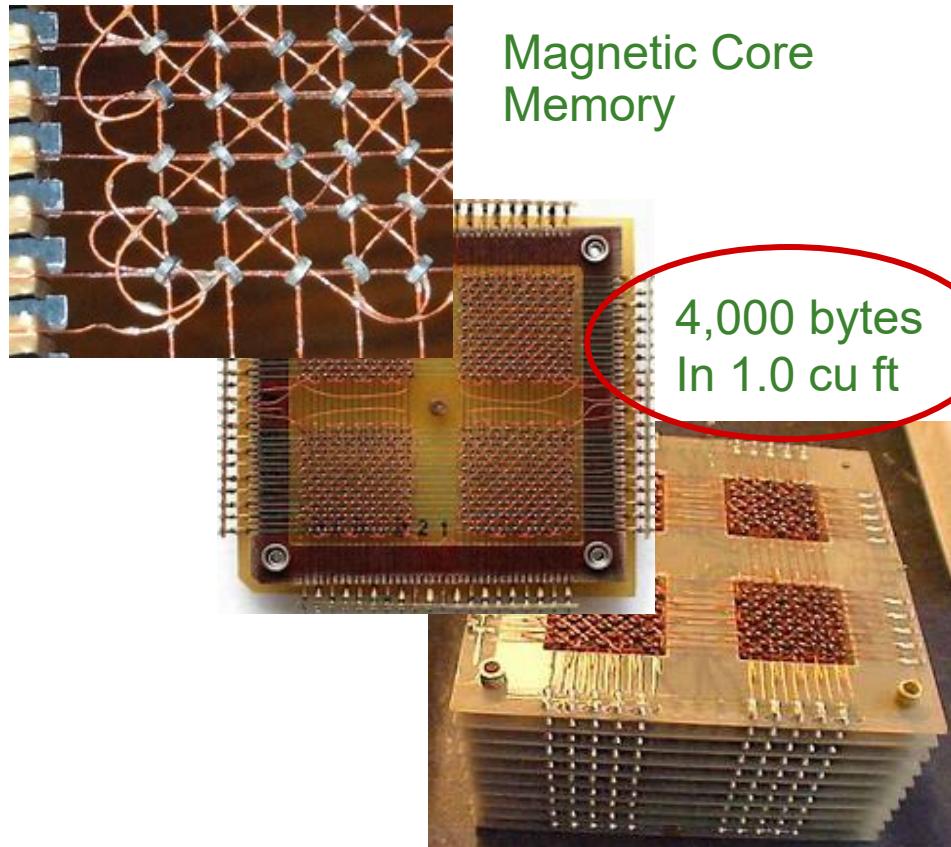
An Analog Throwback



Mechanical Differential Analyzer – Analog machine circa 1950s

Digital Memory Evolution

In the 1950s



In the 2020s

256,000,000,000 bytes
In 0.0001 cu ft !!!



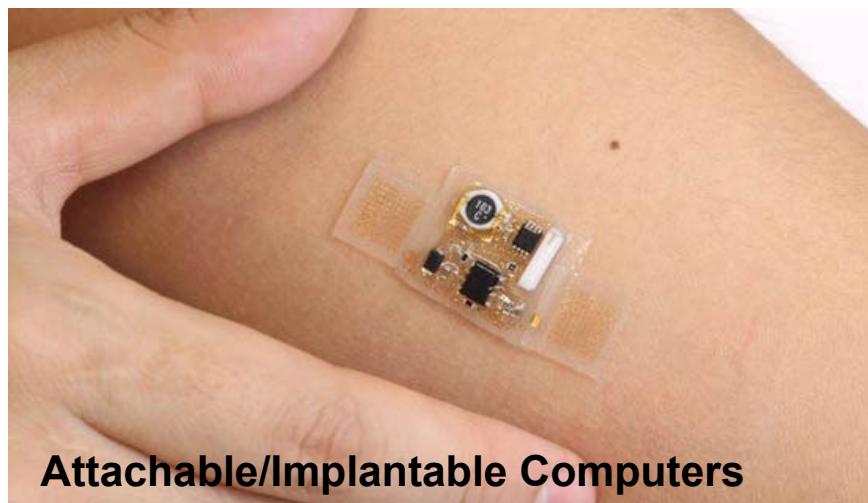
Today's Configurations



Mobile Computers



Embedded Computers



Attachable/Implantable Computers

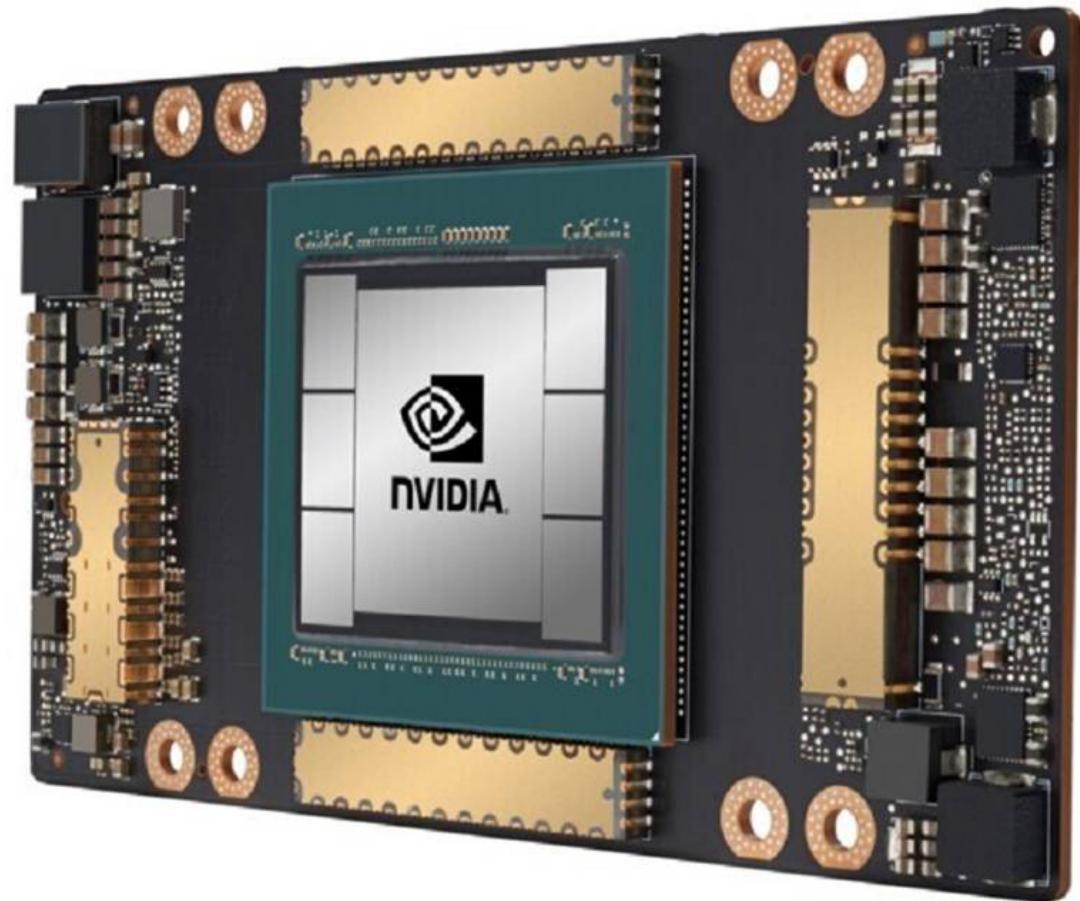


Wearable Computers

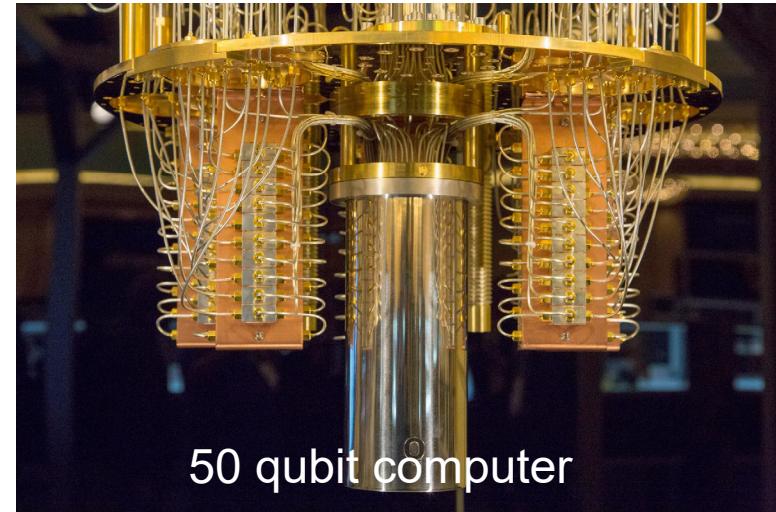
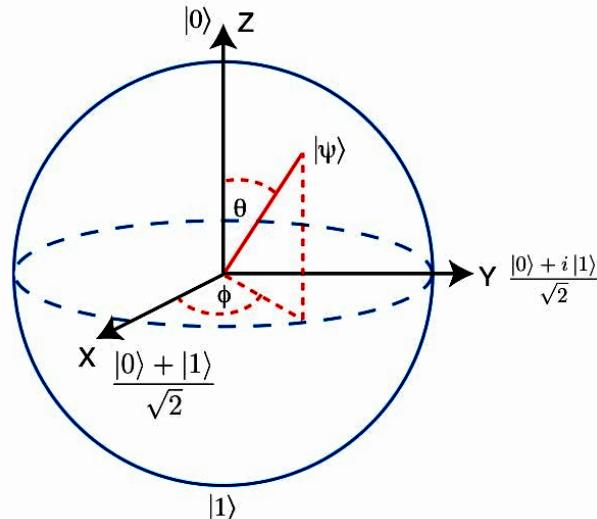
State-of-the-Art CPU

According to the company:

"NVIDIA A100 Tensor Core GPU delivers unprecedented acceleration at every scale to power the world's highest-performing elastic data centers for AI, data analytics, and HPC. Powered by the NVIDIA Ampere Architecture, A100 is the engine of the NVIDIA data center platform. A100 provides up to 20X higher performance over the prior generation and can be partitioned into seven GPU instances to dynamically adjust to shifting demands. The A100 80GB debuts the world's fastest memory bandwidth at over 2 terabytes per second (TB/s) to run the largest models and datasets."



Beyond Bits: Quantum Computing



qubit

The basic unit of quantum information consists of two-levels that can be expressed using the “computational basis” states, and can be a linear combination of both computational states.

entanglement

Entanglement is where the quantum state of any one subsystem cannot be uniquely described independently of the remaining entangled subsystems.

quantum circuit

A quantum circuit is a computational routine consisting of coherent quantum operations on quantum data, such as qubits, and concurrent real-time classical computation.

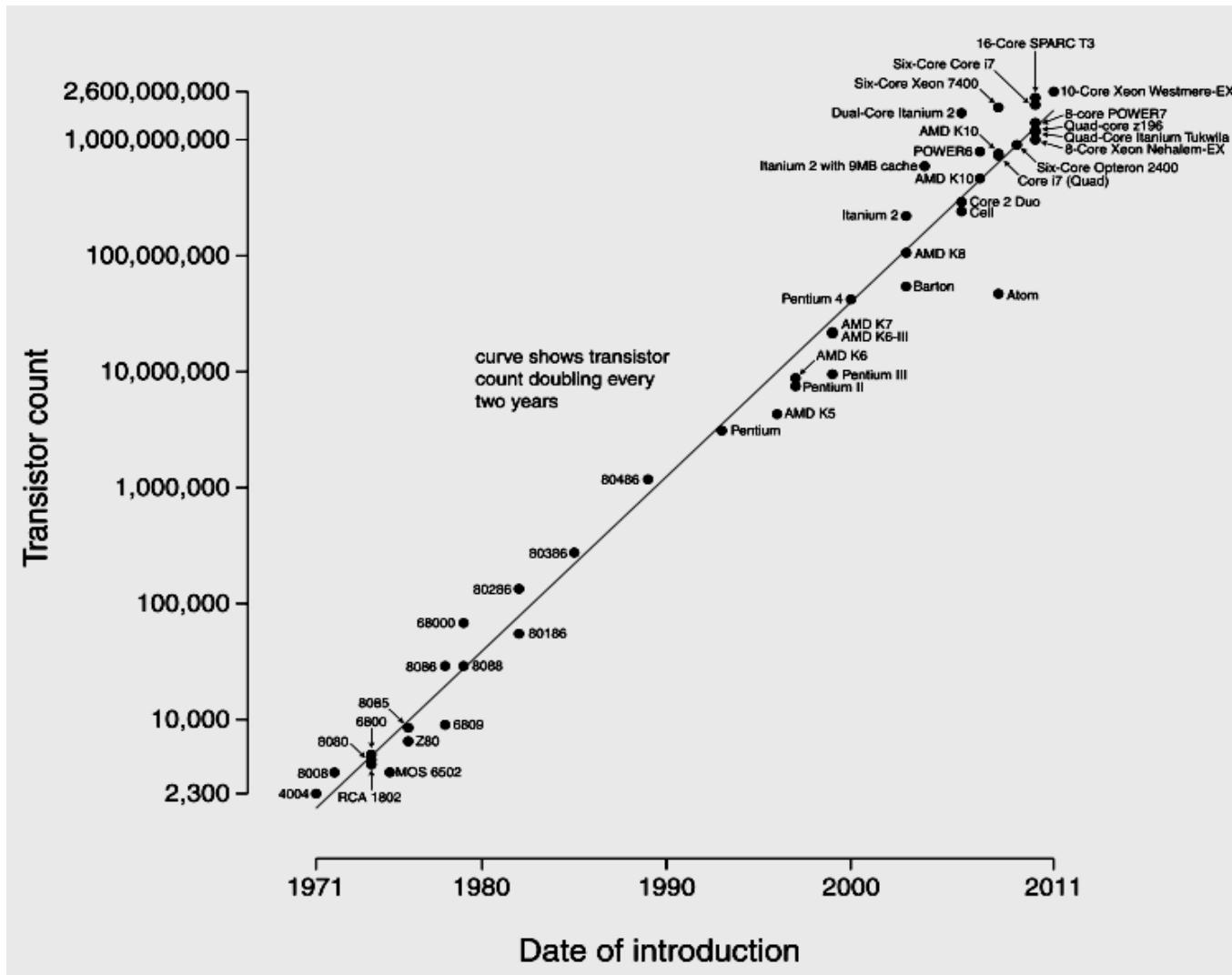
Solutions to computational problems can be 1000x faster than 0/1 digital!

Laws of Computing Growth I

Gordon Moore's Law of Integrated Circuits

- Number of transistors on a chip doubles every 24 months
 - 1972 = 3,500
 - 1985 = 275,000
 - 1997 = 7,500,000
 - 2003 = 58,000,000
 - 2011 = 200,000,000,000
- Start: 1958
- Estimated end: ~2022

Moore's Law Illustrated



Laws of Computing Growth II

Gordon Moore's Law of Integrated Circuits

- Number of transistors on a chip doubles every 24 months
 - 1972 = 3,500
 - 1985 = 275,000
 - 1997 = 7,500,000
 - 2003 = 58,000,000
 - 2011 – 200,000,000,000
- Start: 1958
- Estimated end: 2020

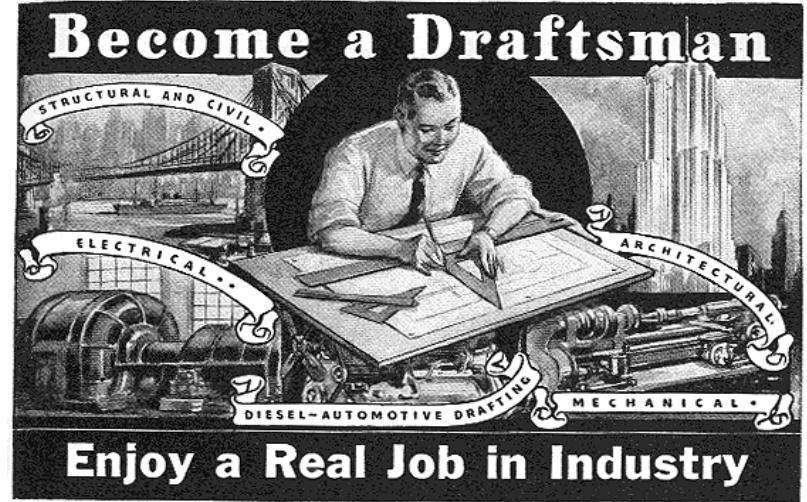
Ray Kurzweil's Law of Accelerating Returns¹

- Computational technology is an evolutionary process and builds on its own progress.
- The time to accomplish a fixed technological objective gets exponentially shorter.
- There is no apparent limit to future increases in computational power.

¹From Ray Kurzweil "The Age of Spiritual Machines, Viking Penguin, 2000

Ethical Case 1: Simulation

- Scientific
 - Description and Prediction: Particle Physics, DNA, Weather, Economics, many other fields
- Industrial
 - CAD/CAM,
 - 3D Computer Graphics, Interactive Design
- Animation: Movies, Dynamics, etc.
- Training and Simulation
 - Augmented Computer Instruction
 - Virtual Simulation (e.g., SIMNET)
 - Demonstration and Practice



Simulation: Oil Movement



Video provided by the National Center for Atmospheric Research (NCAR) during the Gulf of Mexico oil spill (with a warning that this was only a simulation)

Simulation: Flight Training

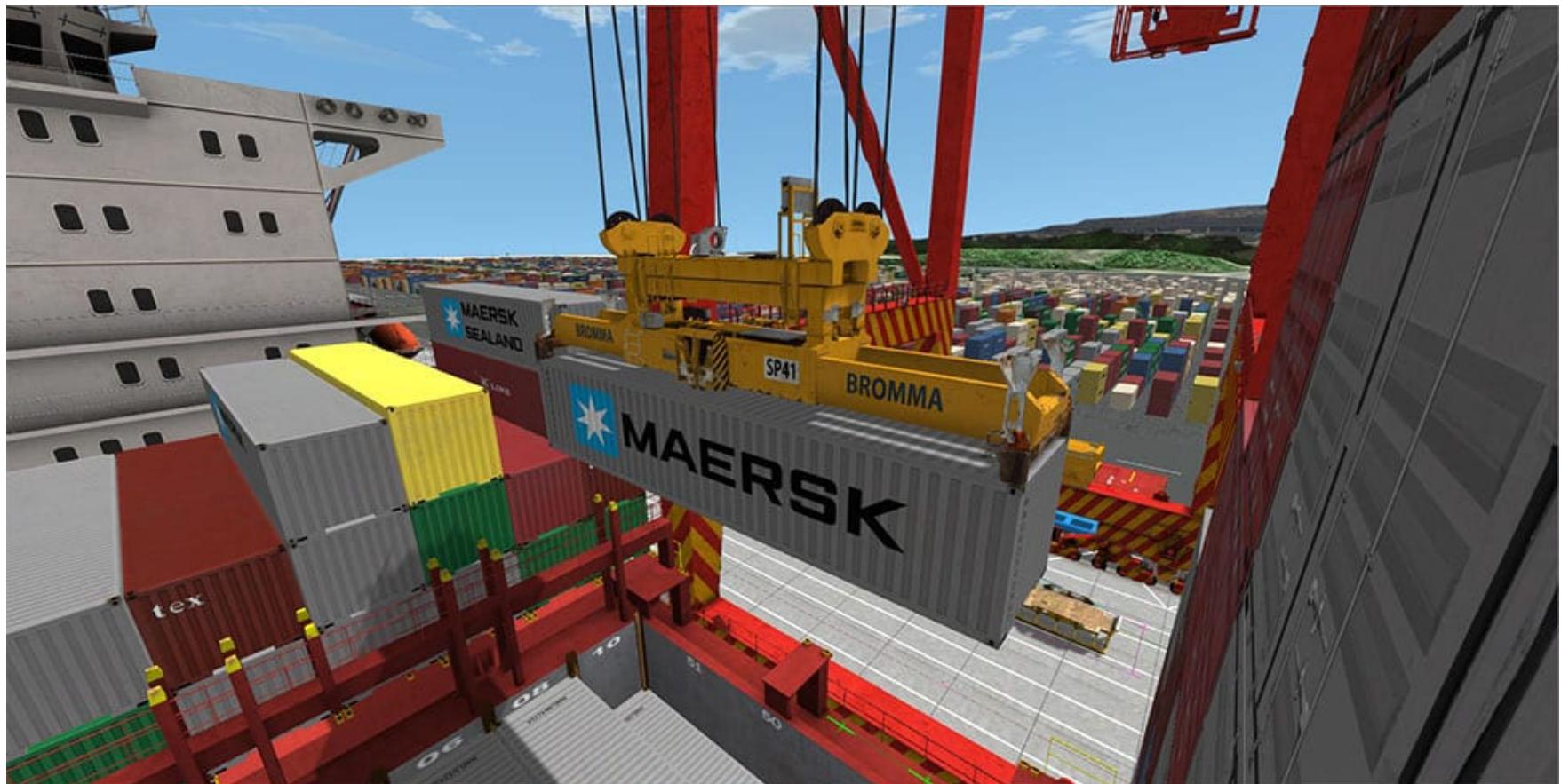


¹Evans and Sutherland, 2003

Simulation: Train Driving



Simulation: Crane Operation



Simulation: Surgery



Simulation: Digital Humans



DI-Guy™ is software for adding lifelike human characters to real-time simulations. DI-Guy lets the user add realistic human characters to real time simulations rapidly, reliably, and with minimum technical risk, while achieving high levels of visual realism and real-time performance.

DI-Guy™ images from Boston Dynamics, Inc., Cambridge, MA

Simulation: The Virtual Battlefield

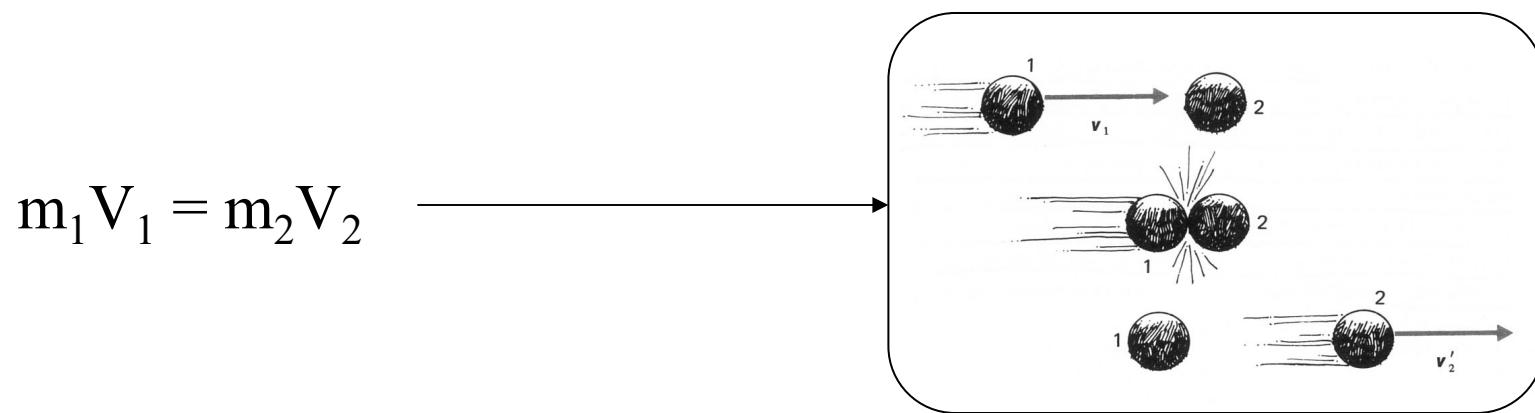


Close Combat Tactical Trainer (CCTT)

Key Ethical Issues of Simulation

- Believability
- Transparency as well as Accuracy

The Power of Visualization



A Previous Observation...



Rene Magritte, 1929

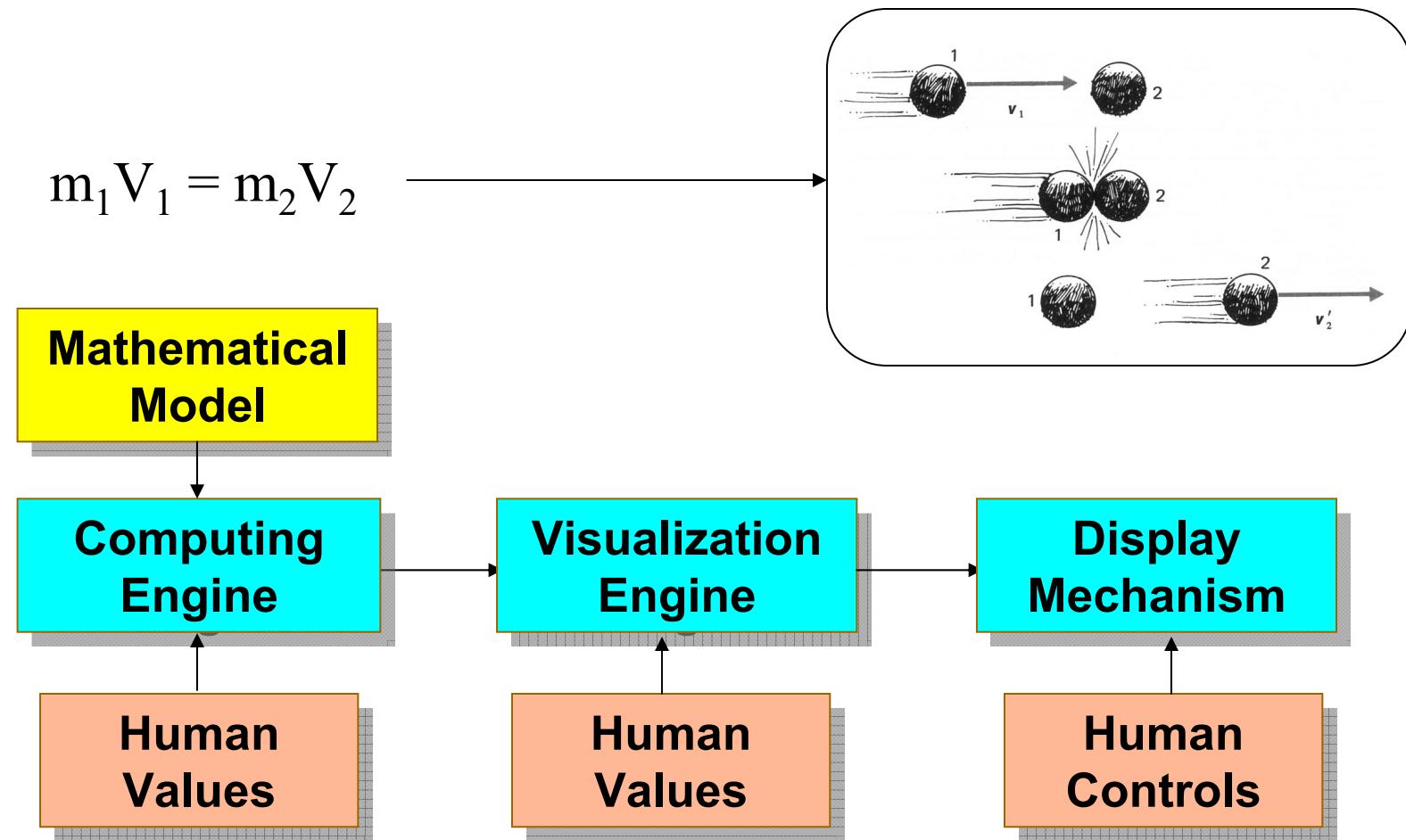
...and Likewise



...and Likewise

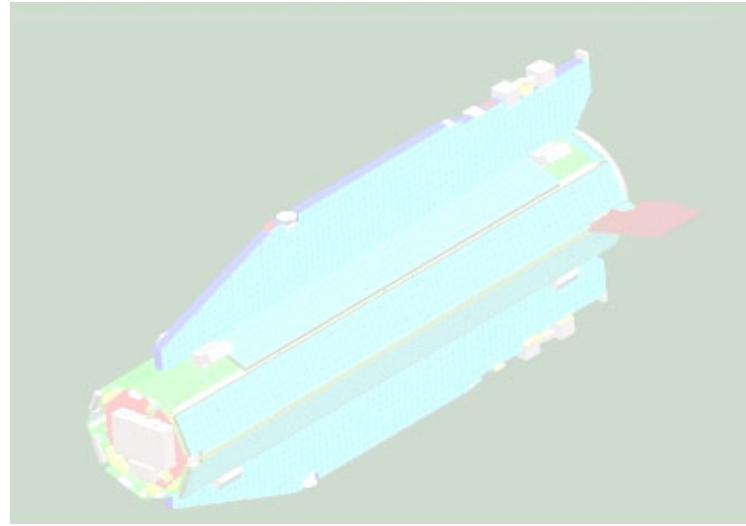


Basis of Transparency: Human Inputs



Ethical Case 2: Gaming

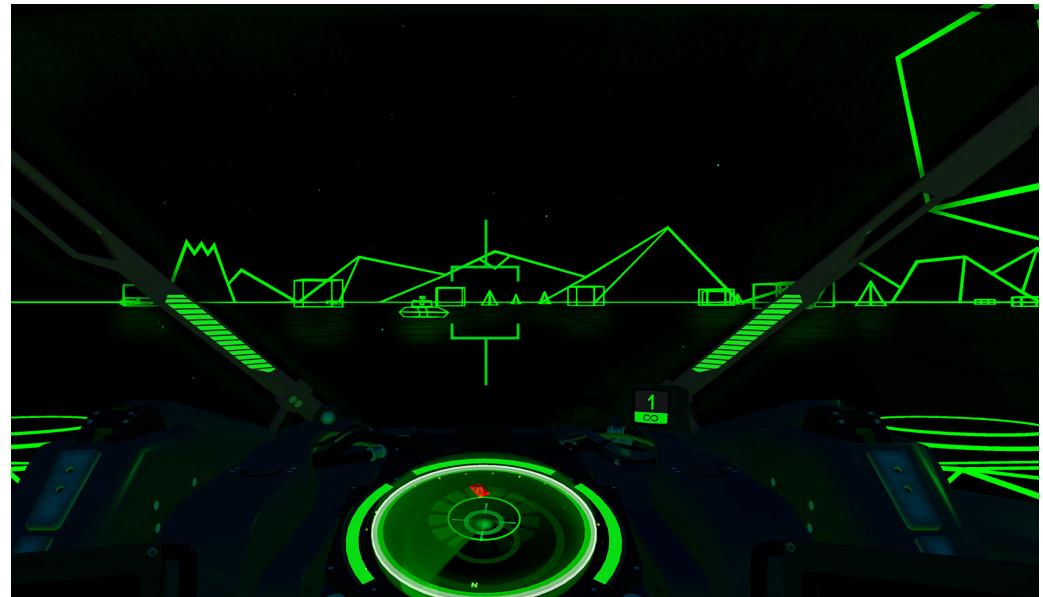
- Scientific
 - Description and Prediction: Particle Physics, DNA, Weather, Economics, many other fields
- Industrial
 - Design: CAD/CAM, 3D Computer Graphics, Interactive Design
 - Optimization: Operations, security, etc.
- Animation: Movies, Dynamics, etc.
- Training and Simulation
 - Augmented Computer Instruction
 - Virtual Simulation (e.g., SIMNET)
 - Demonstration & Practice
- Gaming & Entertainment
 - Single Player Shooter, Sports, etc.
 - MMOG to MMORPG
 - Virtual Communities



Gaming: Early Successes

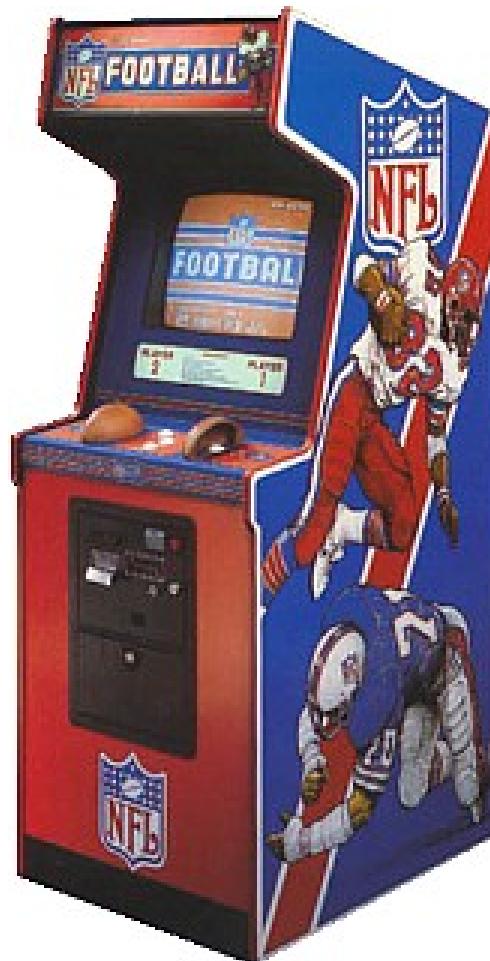


'Pong' game console (1972)



'Battlezone' by Atari (1980)

Gaming: Perceptronics' Contributions



In 1983 we developed an interactive Laserdisc game and sold it to Bally/Midway

Gaming: Perceptronics' Contributions



SIMNET = Networked Virtual Reality System

In 1987-1990 we fielded SIMNET, the world's first massively multiplayer online game

Video Games Hurry to Catch Up...



UnReal First Person Shooter for Windows PC 1998

...and To Stake a Claim



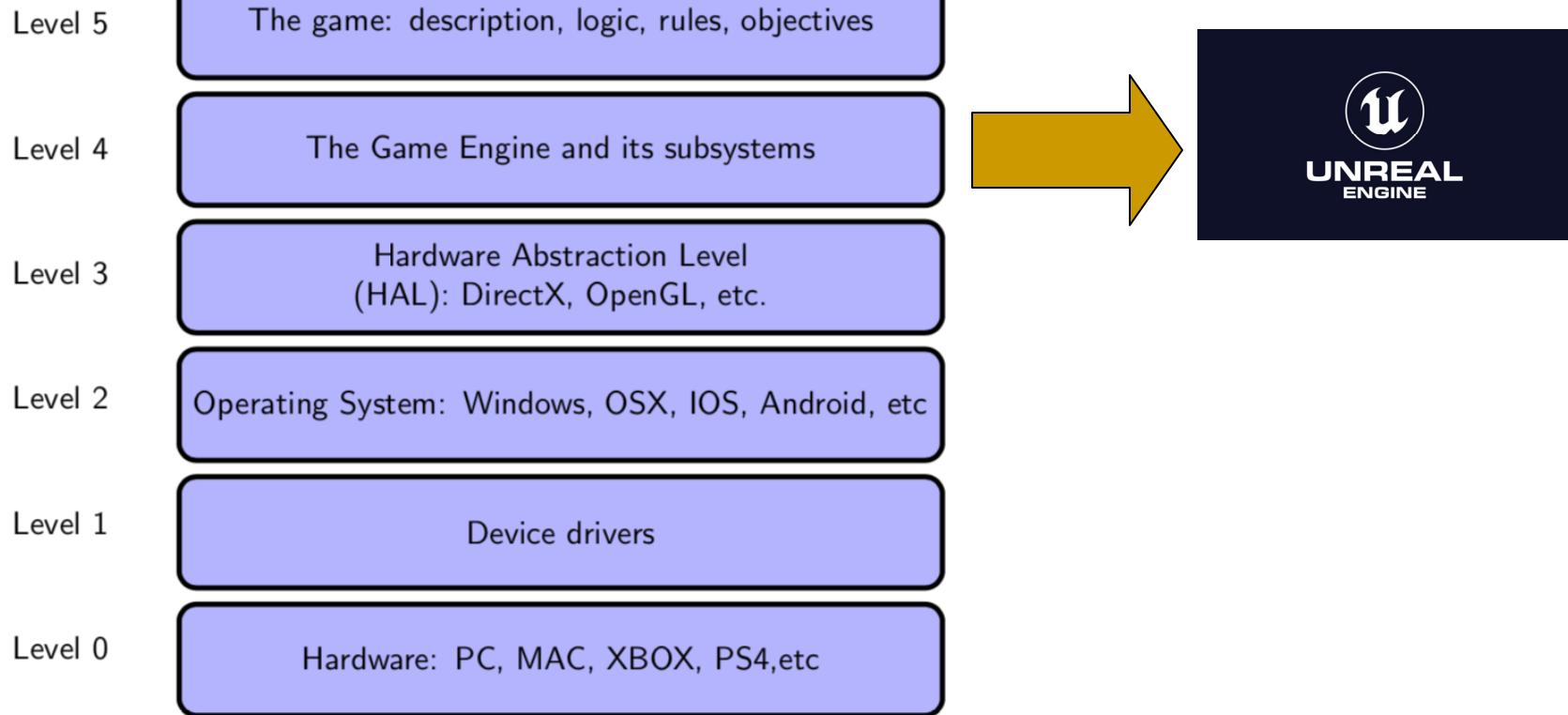
PlayStation 2, Sony, 2000



Xbox, Microsoft, 2001

Specialized computer systems are developed to improve the game experience.

Game Components



Early Unreal Interface



The Unreal interface lets the developer assemble a game from components.

More Recent Capabilities



<https://cesium.com/learn/unreal/unreal-placing-objects/>

Unreal game engine now allows the addition of digitized real world environments.

Digitizing the World



Unreal Engine's scanning and modeling technology obtained from Capturing Reality, the Slovakian photogrammetry software developer.

<https://aecmag.com/reality-capture-modelling/unreal-engine-reality-capture-capabilities-enhanced/>

Environments Get More Exotic

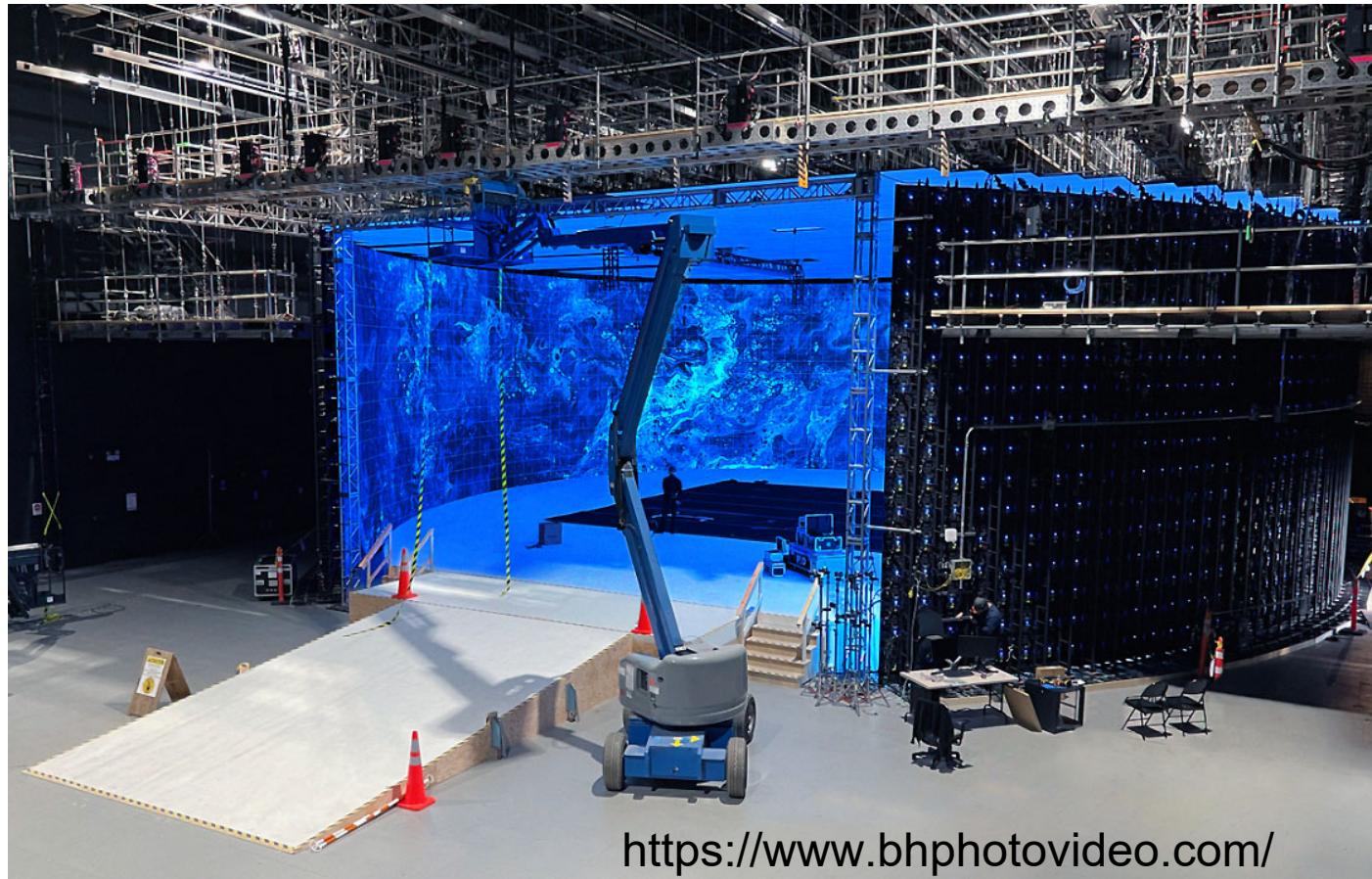


unrealtournament.com

Virtual Worlds are Created



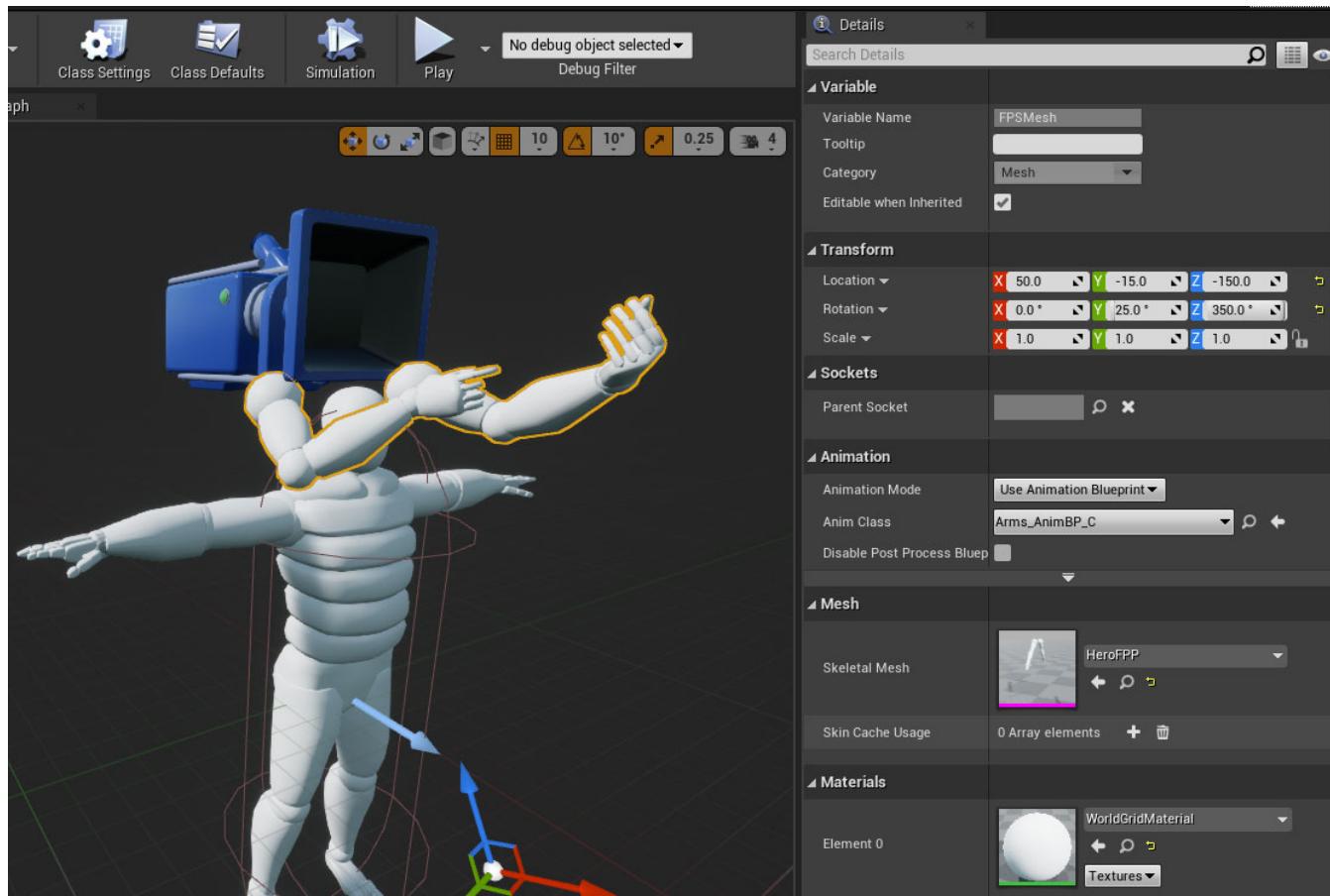
For Movies As Well As for Games



<https://www.bhphotovideo.com/>

Highly realistic L.E.D “Volume” movie/TV set are replacing “green screens”

And Also Virtual People: Unreal 3D Avatars



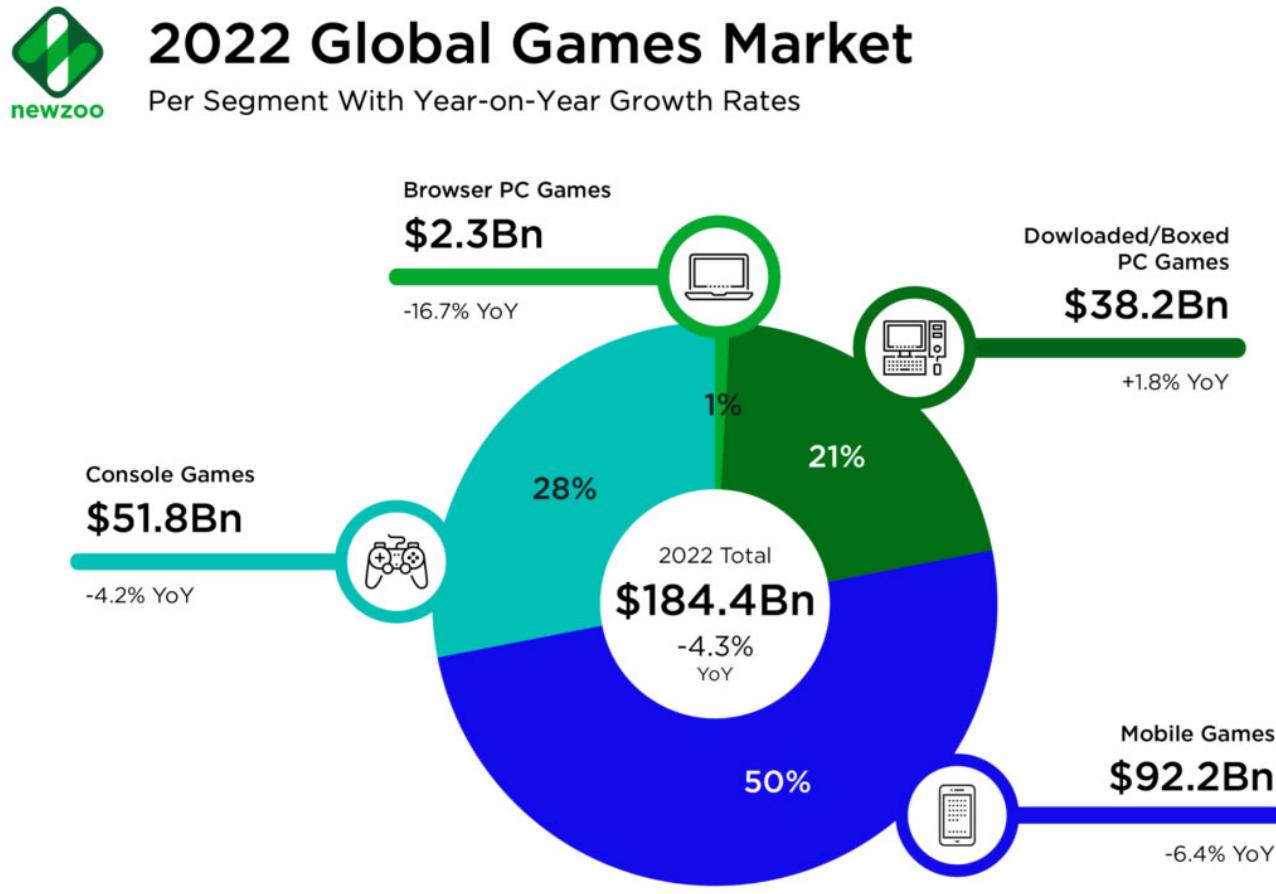
<https://docs.unrealengine.com/>

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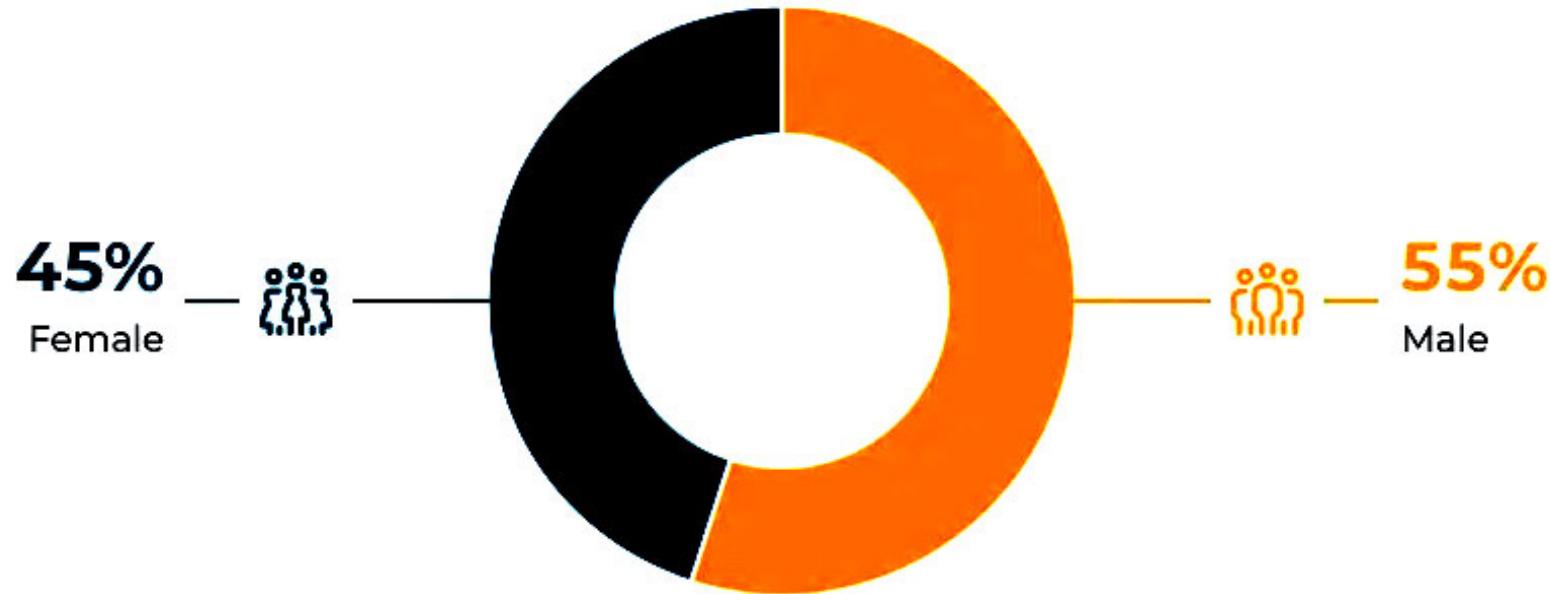
Gaming: Market Size



Source: ©Newzoo | Global Games Market Report | November 2022
newzoo.com/globalgamesreport

Source: <https://newzoo.com/insights/articles/the-latest-games-market-size-estimates-and-forecasts>

Gaming: US Demographics



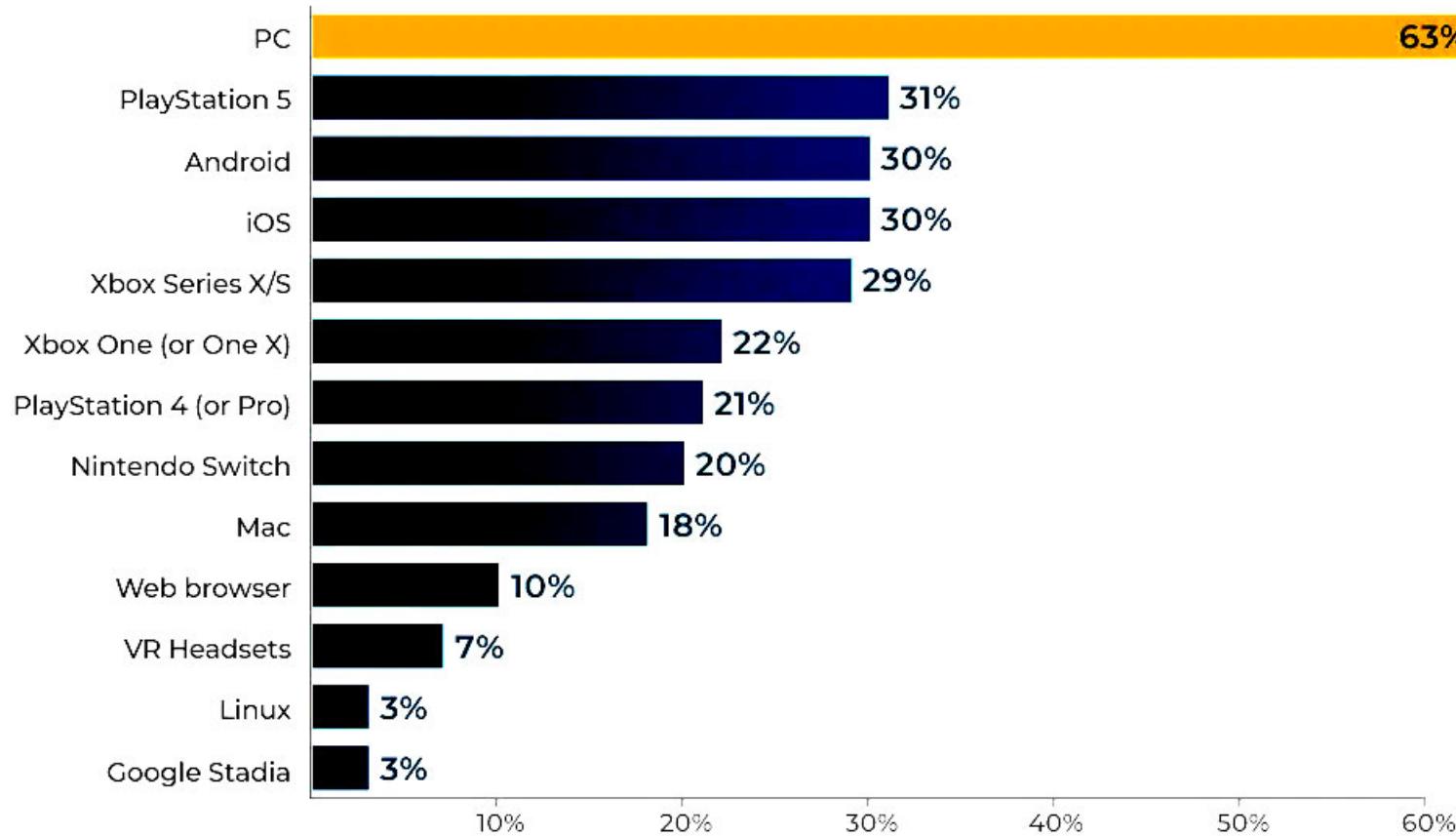
- In 2022 about 54% of the US population, or 183 million were digital gamers.¹
- US consumer spending in for video gaming was greater than \$60 billion.²

¹InsiderIntelligence, ²TrueList

Gaming: Platforms



Top Gaming Platforms for Game Developers



Gaming: Popularity



The best selling game of all time is PlayerUnknown's Battlegrounds, on Unreal Engine 4 for multiple platforms, >70 million copies sold, and revenues over \$1B.

Ethical Issues of Gaming

- Promoting opposing life styles
 - Communal, cooperative and respectful
 - Antisocial, violent, misogynist and racist

Gaming “Aspirational” Roles



Fashion Fits, Fugazo Games



The Sims 4 Electronic Arts

Gaming “Aspirational” Roles



Fashion Fits, Fugazo Games



The Sims 4 Electronic Arts

Gaming “Action” Roles



Battlefield 3, Electronic Arts



Grand Theft Auto V, Rockstar Games

Ethical Issues of Gaming

- Promoting opposing life styles
 - Communal, cooperative and respectful
 - Antisocial, violent, misogynist and racist
- Blurring societal distinctions
 - Legal and illegal actions
 - Ethical and unethical viewpoints
 - Normal and pathological behaviors
- Learning *and practicing* real world behaviors
 - Positive and productive
 - Negative and destructive

The ethical issues are particularly important in the case of violent video games

Pros and Cons of Violent Games¹

- The Pros
 - Games cause aggression but not violence
 - Statistics do not support violent games as cause of mass shootings
 - Sales have increased but violent juvenile crime rates have decreased
 - Players know the difference between game and real-world violence
 - Research shows positive effect on kindness and pro-social behavior
 - **Games provide opportunities to explore consequences of violence, develop moral compass, and release anger and aggression**
- The Cons
 - Playing games causes more aggression, bullying and fighting
 - Simulating shooting and hand-to-hand fighting can cause real behavior
 - Games desensitize players to real-life violence
 - Inhabiting violent characters can cause imitation in real life
 - Violence against women leads to harmful attitudes and actions
 - **US military has used violent games to recruit and train soldiers**

¹Encyclopediæ Britannica, Inc.; ProCon.org; January 5, 2022

US Army Games



If combat games have been used to recruit and train soldiers, can't violent role-playing games be training *at least some players* for anti-social action?

One Sample Case

YAHOO! NEWS

Norwegian killer used computer wargames to plan attack

 REUTERS By Walter Gibbs | Reuters - 5 hrs ago

OSLO (Reuters) - Norwegian anti-Islamic fanatic Anders Behring Breivik told a court on Thursday that he used computer games to prepare for his attacks, once spending an entire year isolated from society playing a game for hours on end.

Breivik, on trial for massacring 77 people last July, said he spent "lots of time" playing Modern Warfare, a first-person shooting game, and also took an entire year off to play World of Warcraft, a multi-player role-playing game with more than 10 million subscribers.

"I don't really like those games but it is good if you want to simulate for training purposes," Breivik said as he discussed Modern Warfare, smiling when asked about the aiming system.

Breivik killed eight people with a car bomb in Oslo on July 22 and then killed 69, mostly teenagers, at a Labour Party summer youth camp on Utoeya island, in a gun massacre.

Although he pleaded not guilty, he admitted the killings, saying his victims were traitors who supported immigration and multiculturalism, threatening Norwegian ethnic purity.

Breivik, who once played Modern Warfare 17-hours straight on New Year's Eve 2010/2011, said he used such games to simulate the police response and the best escape strategy.



Ethical Issues Become a Legal Issues

Court hears arguments on violent video games

AP Associated Press



Buzz up! 31 votes

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By JESSE J. HOLLAND, Associated Press – 59 mins ago



AP – In this image released by Rockstar Games, a scene is shown from 'Grand Theft Auto V: The Lost and Damned,' ...

WASHINGTON – The Supreme Court on Tuesday expressed sympathy for a California law that aims to keep children from buying ultra-violent video games in which players maim, kill or sexually assault images of people.

But justices seemed closely split on whether the restrictions are constitutional.

to animals earlier this year.

The high court has been reluctant to carve out exceptions to the First Amendment, striking down a ban on videos showing graphic violence

California officials argue that they should be allowed to limit minors' ability to pick up violent video games on their own at retailers because of the purported damage they cause to the mental development of children.

Some justices appeared to agree.

"We do not have a tradition in this country of telling children they should watch people actively hitting schoolgirls over the head with a shovel so they'll beg with mercy, being merciless and decapitating them, shooting people in the leg so they fall down," Chief Justice John Roberts said.

Roberts decried that one game lets a player "pour gasoline over them, set them on fire and urinate on them." "We protect children from that," he said. "We don't actively expose them to that."

Courts have usually acted against restraint of games, citing the 1st Amendment.

be able to buy the games for their children, but retailers who sell directly to minors would face fines of up to \$1,000 for each game sold.

The Gamer Community Defends Violence

The screenshot shows the homepage of the Gamergate website. At the top, it reads "#GAMERGATE A NEW VOICE IN GAMING JOURNALISM" and lists categories: XBOX | PS4 | WII U | PC | PARANOIA | CONSPIRACIES. Below this is a large image of a woman (Anita Sarkeesian) in front of the Twin Towers, with a caption: "ANITA SARKEESIAN The proof that she was responsible for 9/11! By David Icke". To the right is another image comparing an orange and an apple, titled "DEPRESSION QUEST VS HALO 5 The definitive comparison". Below these are two kittens, with the caption "DO U EVEN FACT CHECK? Meet our fact checkers: two impartial cats". On the left side, there's a section for "RECENT ARTICLES" with titles like "I Am Not a Fraudul... Who Screws Writers" and "I Saw Zoe Quinn in a Bar Once". On the right side, there's a "MOST SHARED" section with articles like "The Top 10 Feminist N... Who Make Women Think We're Misogynist".

RECENT ARTICLES

I Am Not a Fraudul... Who Screws Writers
Listen, I'll tell you all about the Ayn Rand book I read in high school. [Read more...](#)
By Milo Yiannopoulos | 45 comments

I Saw Zoe Quinn in a Bar Once
And she was talking to another human being! See? See?! [Read more...](#)
By A Bro Who Would Prefer to Remain Anonymous | 63 comments

About Us

MOST SHARED

1. The Top 10 Feminist N... Who Make Women Think We're Misogynist
2. Why Gamers Never Get Invited to Parties: The Conspiracy Revealed
3. We Expose Editors Who Tell Their Journalists What to Write About!

Gamers started Gamergate to defend their right to engage in violent games, even those that emphasize sexism and violence against women, but parts of the community fought back against this use of free speech principles.

A Philosopher Goes Deeper

Christopher Bartel, Professor of Philosophy and Religion at Appalachian State University, asks:

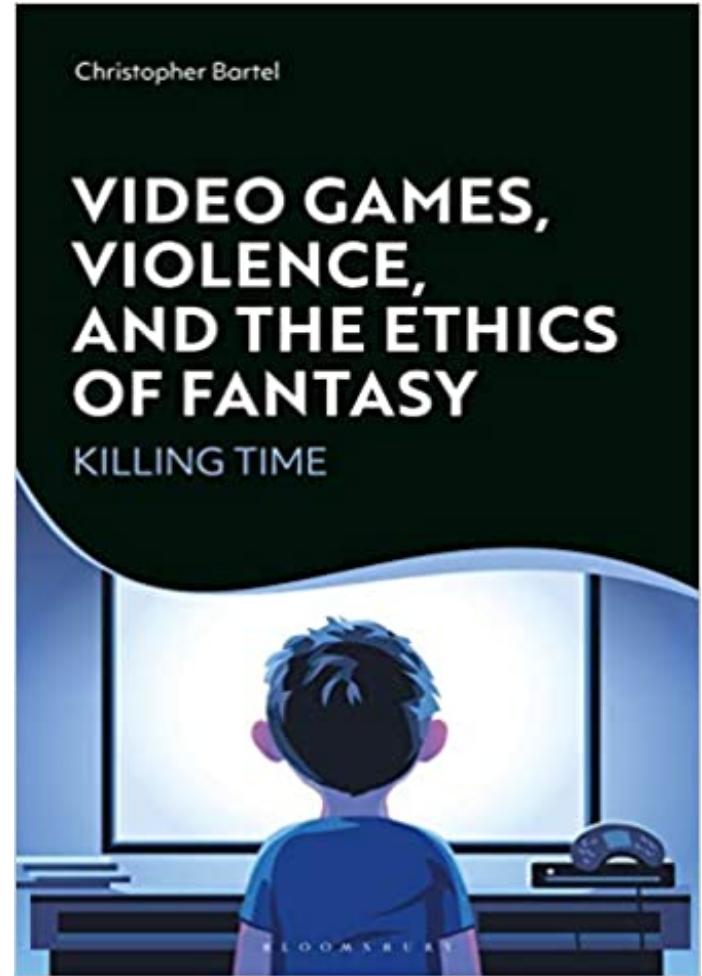
“Should players worry about the morality of their virtual actions when playing video games that allow them to commit numerous violent and immoral acts like sexual assault, theft, and murder.”

He recognizes that the issues include:

- Absence of actual harm
- Morality of violent fantasizing
- Various motivations
- Unknown repercussions

But is concerned nevertheless.

If there is moral harm in playing violent games, are developers the immoral “enablers?”



Games Can Be Basically Bad...



Survival Island 3- Australia Story 3D, a 2015 game that encouraged players to kill Indigenous Australians, removed from Google Play and iTunes after a public backlash

...or Unintentionally Bad

In the interest of making learning fun, the “Playing History 2 -Slave Trade” game by Danish company Serious Games rewarded players for:

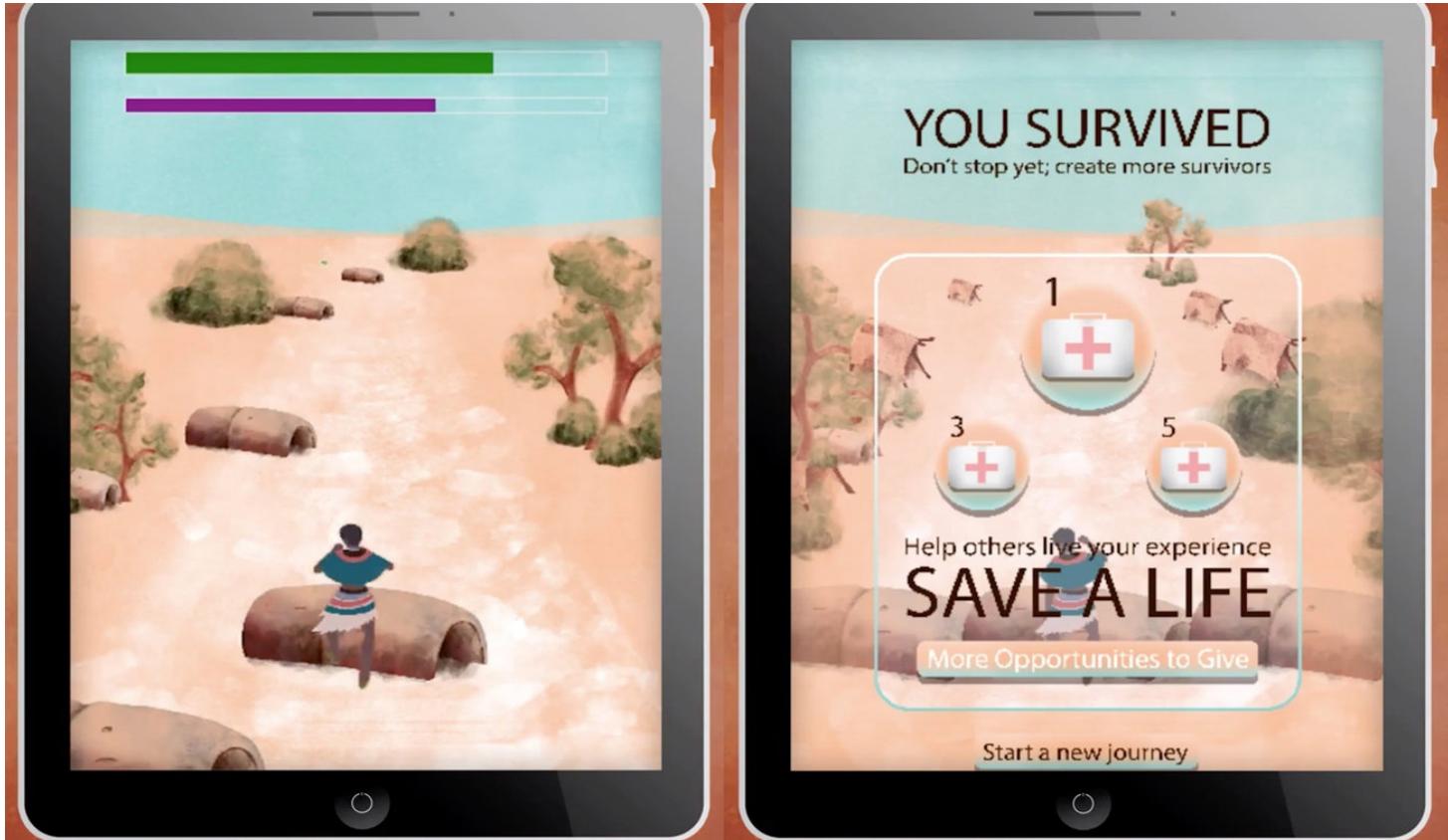
- Following “master’s” orders
- Negotiating for slaves
- Buying slaves at low cost
- Stacking slaves efficiently in ship
- Sailing quickly to ship’s destination
- Finding delicacies for the crew
- Selling slaves at a profit



Supplemental readings and a partial “happy ending escape” helped the case, but the player was still left with a skewed, “white centric” view of the slave trade. To its credit, the company responded to the criticism and redesigned the game.

Dexter Thomas, “It’s a lesson in how not to teach,” Los Angeles Times, September 7, 2015

A Serious Game Done Right



Salaam, a video game developed by Lual Mayen, a refugee from South Sudan, let players gather resources like food and medicine while running away from violence. A portion of the income went to aid actual refugees.

A Rating Process

The screenshot shows a web browser window with the ESRB website open. The URL in the address bar is <https://www.esrb.org/ratings-guide/>. The page title is "Rating Categories". The main content displays four rating categories: "EVERYONE", "EVERYONE 10+", "TEEN", and "MATURE 17+". Each category is represented by a black and white logo with the rating letter in large letters and "ESRB" below it. To the right of the logos is a "SHARE" button with icons for Facebook, Twitter, LinkedIn, and Email. At the bottom of the page are navigation arrows for "PREVIOUS" and "NEXT". The browser's toolbar at the top includes links for "Mail - Gershon Weltman - Outlook", "Reading List", and several other tabs related to email and web browsing.

<https://www.esrb.org/ratings-guide/>

A Request for More Detailed Ratings



The writer says that games should be rated for their educational value, but doesn't suggest rating them for ethical value as well – not an unusual omission.

Los Angeles Times, May 11, 2021

Game Developers' Ethical Code I



Guiding Principles

- Community
- Professionalism
- Expression
- Innovation
- Leadership
- Impact
- Fun

Game Developers' Ethical Code II



International Game Developers Association

Guiding Principles

- Community
- Professionalism
- Expression
 - Games are like art, other media
- Innovation
- Leadership
- Impact
- Fun

Game Developers' Ethical Code



Guiding Principles

- Community
- Professionalism
- Expression
 - Games are like art, other media
- Innovation
- Leadership
- Impact
 - Learning, creativity, innovation
- Fun

No statement regarding *violence, misogyny, racism, or ethics* in game contents!

Game Developers' Ethical Code III



Developers' Ethics

- Equal Access and Opportunity
- Give Respect and Credit
- Present Self Accurately
- Respect IP Rights
- Promote Fair Ownership Rights
- Honor Legal Agreements
- Use Computer Tech Properly
- Cooperate with Ratings Boards
- Share Knowledge
- Promote Public Knowledge
- Promote this Code of Ethics

No statement regarding *violence, misogyny, racism, or ethics* in game contents!

Gaming Ethical Summary

- Simulation -based games are a big and rapidly growing >\$200B industry today, almost 3x the size of the \$77B movie industry.
- Games can be valuable educational tools as well as compelling entertainment.
- They can teach bad ethics as well as good ethics, sometimes inadvertently, and may help promote anti-social behaviors as well
- *What's in a game reflects individuals' decisions and individuals' actions!*
- *Game designers and producers need to consider carefully if they want to advance constructive ethical positions, and then ensure that their games actually do so*

Our hope is that simulation-based games will enhance society, not devalue it!

Ethical Issues: A New Problem

- Promoting opposing life styles
 - Communal, cooperative and respectful
 - Antisocial, violent, misogynist and racist
- Blurring societal distinctions
 - Legal and illegal actions
 - Ethical and unethical viewpoints
 - Normal and pathological behaviors
- Learning *and practicing* real world behaviors
 - Positive and productive
 - Negative and destructive
- Deep Fakes
 - Duplicate Humans
 - Fictional Behaviors

A Product of Gaming Engines...



Unreal's MetaHumans can be virtually indistinguishable from real humans

...Enhanced by AI/Machine Learning



Computer scientists at the University of Washington analyzed millions of videos using a neural net to simulate how Obama's face moved as he talked .

<https://www.bing.com/videos/search?q=simulated+Obama&&view>

To Make the Point

TECH / ARTIFICIAL INTELLIGENCE

ThisPersonDoesNotExist.com uses AI to generate endless fake faces



A few example faces — all completely fake — created by thispersondoesnotexist.com

/ Hit refresh to lock eyes with another imaginary stranger

By JAMES VINCENT

Feb 16, 2019, 4:30 AM PST | — 0 Comments / 0 News



The ability of AI to generate fake visuals is not yet mainstream knowledge, but a new website

— ThisPersonDoesNotExist.com — offers a quick and persuasive education.

The site is the creation of Phillip Wang, a software engineer at



Software engineer Phillip Wang created a site to show the ease of faking faces

A Fake Person Affects a Single Stock



A screenshot of a fake Twitter profile for "Maisy Kinsley". The profile picture is a circular photo of a young woman with blonde hair. The background of the profile page shows a close-up of a dark, textured surface, possibly a car's interior or exterior, with some green foliage visible behind it. At the top right, there is a "Follow" button. Below the profile picture, the name "Maisy Kinsley" and the handle "@msmaysmade" are displayed. The bio reads: "Senior Journalist @ Bloomberg. I tell data-driven stories about cars, cyber security & web culture through words, graphics & passion. DM open for tips or email". It also includes location information ("San Francisco, CA") and a website link ("msmaysmade.com/index.html"). On the right side of the profile, there are four metrics: "Tweets 7", "Following 1,031", "Followers 74", and "Likes 3". Below these metrics, there are two tabs: "Tweets" and "Tweets & replies". Under the "Tweets" tab, a single tweet from "WIRED" (@WIRED) is shown, dated 16 hours ago. The tweet discusses encryption and privacy, mentioning a breakthrough that changes the trade-off between privacy and AI. The tweet has been retweeted by Maisy Kinsley.

Somebody created the fake journalist Maisy Kinsley in 2019 to influence trading in Tesla stock, and in particular to gather information on short selling of the stock.

A Fake Photo Affects the Entire Stock Market

Fake photo spooks Wall St.

Phony image of a blast near the Pentagon causes a brief decline in the S&P 500.

BY DAVEY ALBA

A falsified photograph of an explosion near the Pentagon spread widely on social media Monday morning, briefly sending U.S. stocks lower in possibly the first instance of an AI-generated image moving the market.

Just past 10 a.m. Eastern time, when the photo was circulating, the Standard & Poor's 500 declined about 0.3% to a session low. As news emerged that the image was a hoax, the index quickly rebounded.

The fake photo, which first appeared on Facebook, showed a large plume of smoke that a Facebook user claimed was near the U.S. military headquarters in



PATRICK SEMANSKY Associated Press

AN AERIAL view of the Pentagon in 2022. There was no explosion near the site Monday, officials said.

spread it, people pointed out that the image may have been generated by artificial intelligence.

Nick Waters, a researcher at the open-source intelligence group Bellingcat, said in an interview that the shock of hearing about a rumored explosion near the Pentagon led him to exam-

ter account called Walter Bloomberg, which also carried the report, aren't affiliated with Bloomberg News.

Although the origin of the image remains unclear, speculation that it was generated by AI deepened concerns that emerging technologies that can generate

A Fake Photo Affects the Entire Stock Market

Fake photo spooks Wall St.

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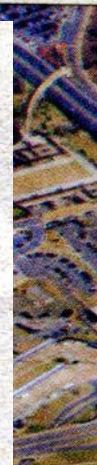
Although the origin of the image remains unclear, speculation that it was generated by AI deepened concerns that emerging technologies that make it easy to create images and other content will accelerate the spread of misinformation.

intelligence.

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Associated Press
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Walter
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Deep Fakes Are Serious

Stanford Law School

The Center for Internet and Society at Stanford Law School is a leader in the study of the law and policy around the Internet and other emerging technologies.

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Home > Publications > Academic Writing > Deep Fakes: A Looming Challenge for Privacy, Democracy and National Security

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DEEP FAKES: A LOOMING CHALLENGE FOR PRIVACY, DEMOCRACY, AND NATIONAL SECURITY

Author(s): Danielle Citron

Publication Type: Academic Writing

Publication Date: July 21, 2018

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DANIELLE KEATS CITRON

University of Maryland Francis King Carey School of Law; Yale University
Yale Information Society Project, Stanford Law School Center for Internet

The problem of identifying deep fakes is difficult and may need AI to help solve.