

A Brief History of Computing

Hult SCI-1 Boston Class

We'll make this document

- It is best to learn history in the context of various developments in Computer Science
- So we'll interject these sessions throughout the course
- We'll summarize this history into a document called:
- A Brief History of Computing
- We'll also create a timeline of events to put things in perspective
- My job will be to put readings into a timeline
- We'll focus on the impact on popular culture and business

Other Activities we will pursue

- Impact of Digital Transformation on Business
- Social Dilemma movie watch
- Fighting the Algorithm Ideas
- Uncovering Bias and promoting fairness in algorithms
- The increasing impact of cybercrime
- Predictive Brainstorming

Group Discussion on Digital Transformation

Changes in
Business Strategies

How have business strategies evolved due to digital transformation? What new opportunities have emerged?

Impact on Industries

Which industries have been most affected by the digital revolution? In what ways have they been impacted?

Adoption of New
Technologies

How have businesses adapted to new technologies like cloud computing and big data? What are the challenges and benefits?

Cybersecurity Today



Cybercrime Impact

The global cost of cybercrime is expected to exceed \$10 trillion by 2025.



Business Vulnerabilities

Businesses face threats from ransomware, phishing attacks, and data breaches, impacting operations and finances.



Key Challenges

Shortage of cybersecurity professionals, increasing complexity of threats, and evolving nature of cyber attacks.



Security Measures

Importance of secure software, data encryption, employee training, and proactive security measures.

Predictive Brainstorming Session



Future Computing Technologies

Discuss potential future technologies such as holographic displays, brain-computer interfaces, or advances in quantum computing.



Business Implications

Consider how these technologies could impact business operations, marketing, or customer experiences.



Adoption and Challenges

Explore the potential challenges in adopting these technologies and how businesses might overcome them.

From Mechanical to Electronic Computing

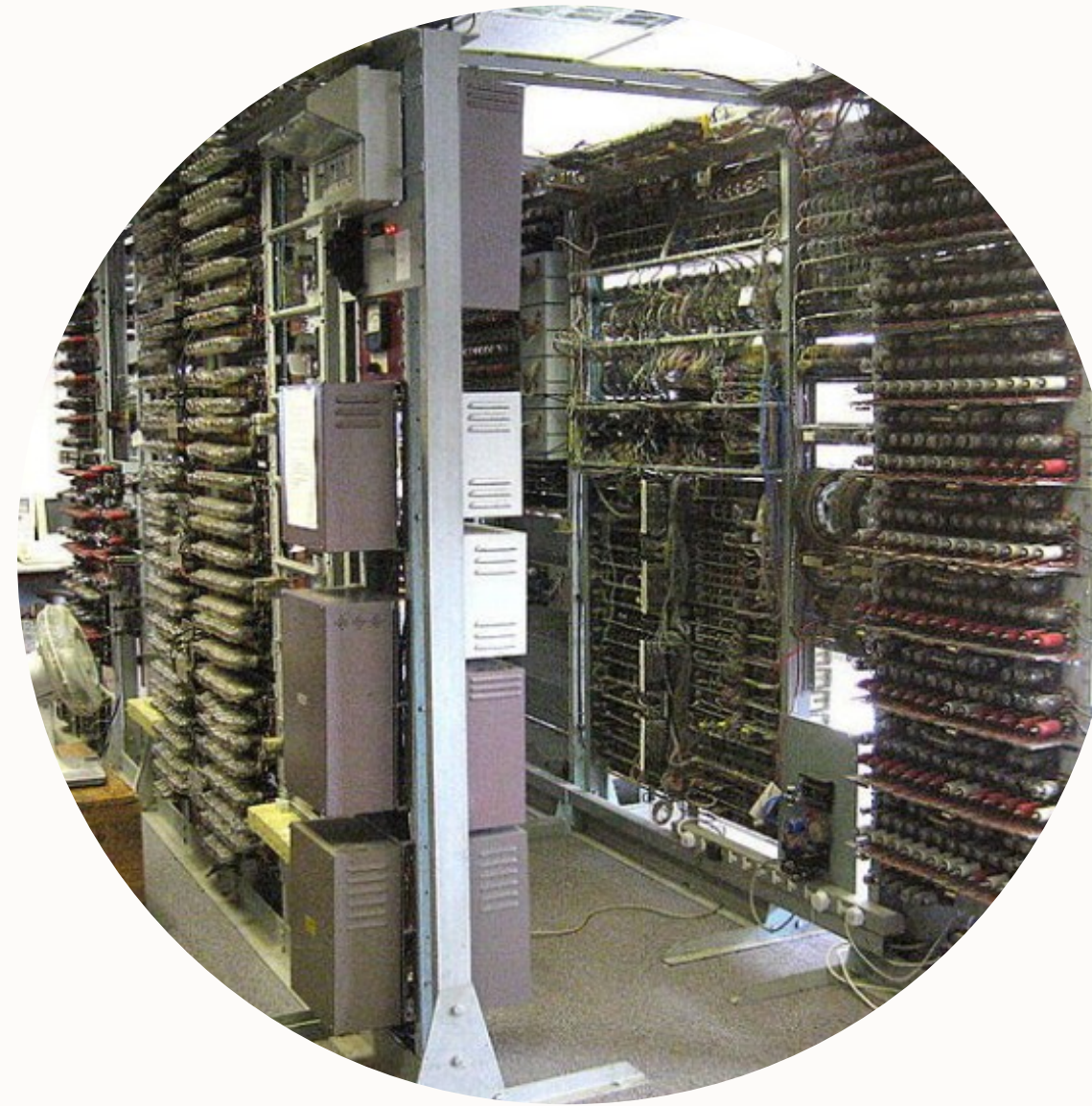
- Early computers were predominantly mechanical, relying on gears and levers to process information.
- The transition to electronic computing brought about a significant shift in the way data was processed and stored.
- The ENIAC, one of the first electronic general-purpose computers, paved the way for modern electronic computing.
- The Colossus and Harvard Mark I were early electronic computers with specific functions like codebreaking and calculations.

ENIAC, Colossus, and Harvard Mark I



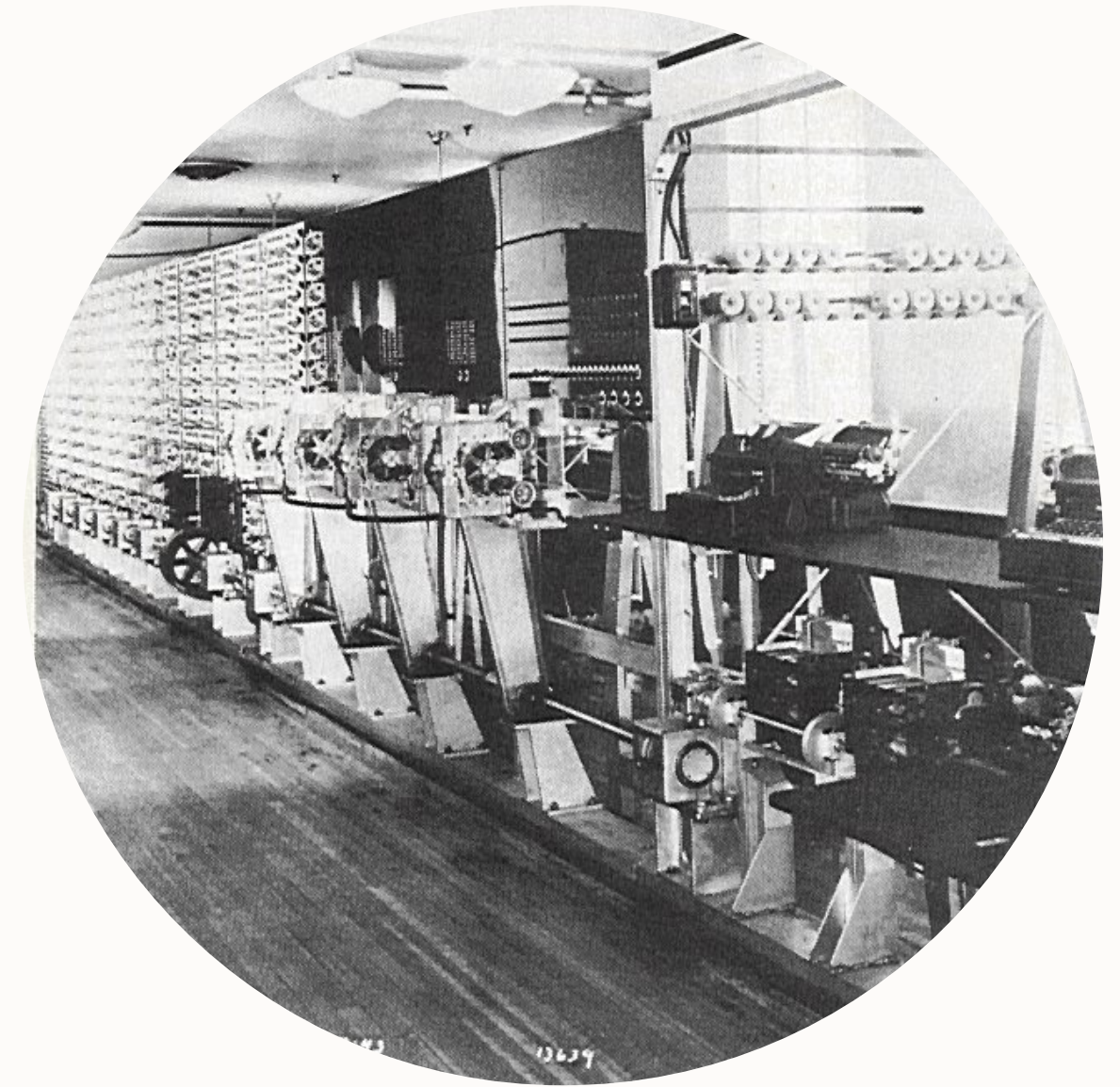
ENIAC

The first general-purpose electronic digital computer, known for its size and capability in solving complex numerical problems.



Colossus

Pioneering electronic digital computer used for code-breaking during World War II, a crucial element in the early history of modern computing.



Harvard Mark I

One of the earliest electromechanical computers, used in war-related calculations and advancements in computer science.

Significant Milestones in Computing



Introduction of the binary number system



Development of the first electronic computers



Invention of transistors and their impact on computing



Introduction of integrated circuits



Early use of computers for numerical computation and codebreaking



Role of mathematical algorithms in early computing



Mathematical Foundations of Computing



The binary number system, fundamental to digital computing, represents numbers using only two symbols: 0 and 1.

Logic gates are the building blocks of digital circuits, using Boolean algebra to process binary information and perform calculations.

Foundational algorithms like sorting and searching form the basis of computational processes and data manipulation.



Binary Number System

Understanding Binary

- The binary number system is the foundation of all digital systems.
- It uses only two digits, 0 and 1, to represent numbers.
- This system is fundamental to computer science because it directly relates to how computers 'think' and process data.



• The Introduction of Transistors



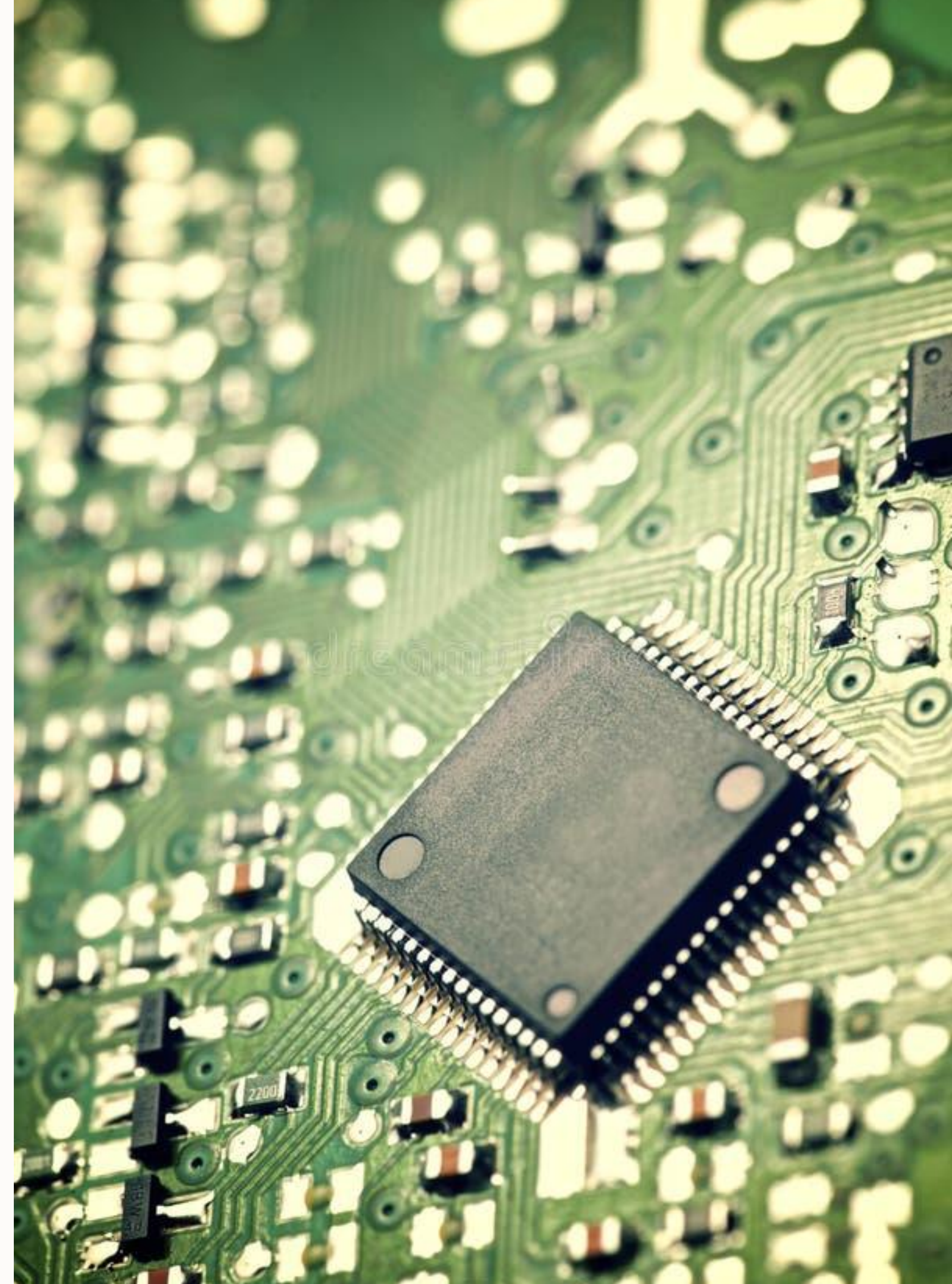
Impact on Computing

- Transistors replaced bulky vacuum tubes
- Smaller transistors enabled the creation of smaller, faster computers
- Computing power and efficiency increased significantly
- Paved the way for modern digital computers

Development of Integrated Circuits

Significance of Integrated Circuits

- Integrated circuits led to a dramatic increase in computing power and efficiency.
- The ability to pack thousands to millions of electronic components on a single chip revolutionized the electronics industry.
- It marked a crucial milestone in the miniaturization of technology, making computers smaller and more powerful.



How we'll proceed

- I'll talk about algorithms and the cloud
- You'll talk and summarize everything else
- Together we'll explore future technologies