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THE COMPUTER

the 30-second history

3-SECOND SURVEY

Computers have enhanced human performance in many fields and permeate modern life to an extent that gives rise to disquiet about our reliance on them.

3-MINUTE OVERVIEW

Computers enable us to carry out many tasks, from sending people to the Moon to sorting through our photographs. But they accomplish this by following pre-set instructions; none has yet passed the 'Turing Test' – they do not pass for human in a comparative test between person and machine. As yet, they don't 'think'. This goes to the heart of the question of what it means to be human.

Before the Industrial Revolution, machines were designed to do one thing – to tell the time or grind corn, for example. But greater mechanization called for something more adaptable. In 1801, Joseph Jacquard built a loom in which interchangeable punch cards were used to control the patterns of cloth produced: the first machine that could be instructed to do more than one task. It was the inspiration for Charles Babbage's 'Difference Engine', conceived in 1822. His idea was for a universal machine capable of limitless calculations that would minimize error and analyse the accuracy of the results. Financial and technological limitations meant that Babbage's machine was never built in his lifetime, but perhaps the reason it took until the twentieth century for the first programmable computers to be developed was that the demand didn't exist. Yet as engineering and military needs became more complex, particularly during the Second World War, issues requiring computations beyond the capabilities of humans in scale and time created that demand. When Alan Turing published his hypothesis of a Turing Machine in 1936 (defined as a machine that can perform any computation that could be performed by any other computing device), he formalized the basis of computing, which together with the application of electronics, provided the foundation for modern computers.

RELATED TOPICS

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3-SECOND BIOGRAPHIES

ADA LOVELACE
1815–52
English mathematician who wrote an algorithm for use by Babbage's analytical engine

KONRAD ZUSE
1910–95
German inventor who built the first fully program-controlled computer, the Z1, in 1938 and the first functional programmable computer, the Z3, in 1941
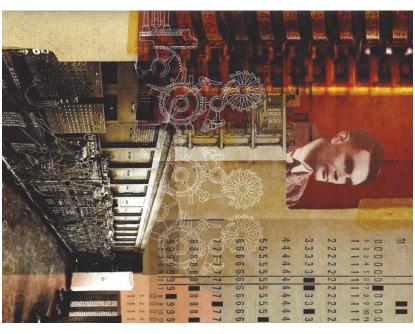
ALAN TURING
1912–54
English mathematician whose analysis of methodical process led to the development of 'definite method' – in modern language, an algorithm

30-SECOND TEXT
Diana Rawlinson

ENIAC, the world's first electronic computer, cost $500,000 and occupied the same floor space as a small house.

Source: 30-second Great Inventions by David Boyle