Alan Turing

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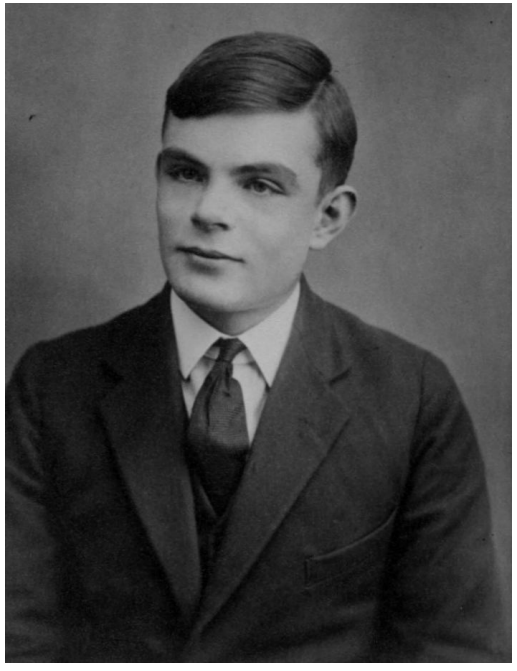
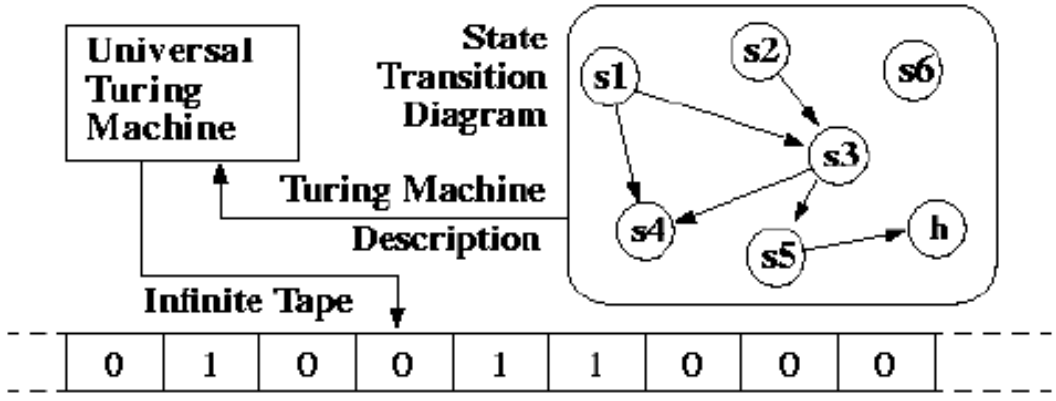
Alan Mathison Turing (1912 - 1954)



- British computer scientist, mathematician, logician, cryptanalyst and theoretical biologist
- Remembered as the founder of the field of Computer Science
- Invention of the Turing machine
- Created first designs of a stored computer program
- War hero, marathon runner



Universal turing machine abstraction

A mechanical turing machine

Early Life

- Became interested in math and science at the Sherborne School when he was 13.
- Studied as an undergraduate from 1931 to 1934 at King's College, Cambridge, and he gained first-class honours in mathematics.
- In 1935, at the age of 22, he proved the central limit theorem and he was elected a fellow of King's.
- In 1936, Turing published his paper "On Computable Numbers, with an Application to the Entscheidungsproblem".

Early Life - Continued

- Studied mathematics and cryptology at the Institute for Advanced Study in Princeton, New Jersey.
- Got his Ph.D in 1938 from Princeton.
- Soon after returned to Cambridge.

Cryptanalysis and Early Computers

- During World War II, Turing was a leading participant in wartime code breaking.
- Worked at Bletchley Park, the GCCS[1].
- He specified the bombe: A machine used to decipher Enigma encryptions. Turing cracked the Enigma code in late 1939.
- Wrote two papers about mathematical approaches to code-breaking.

[1] *GCCS*: Government Code and Cypher School

Bombe

Each of the rotating drums simulates the action of an Enigma rotor. There are 36 Enigma-equivalents and, on the right-hand end of the middle row, three indicator drums.

To London

- Moved to London in the '40s and started working for the National Physical Laboratory.
- Designed work for the Automatic Computing Engine.
- First addressed artificial intelligence in his 1950 paper "Computing Machinery and Intelligence".

Computing Machinery and Intelligence

- Last paragraph of the paper:

  We may hope that machines will eventually compete with men in all purely intellectual fields. But which are the best ones to start with? Even this is a difficult decision. Many people think that a very abstract activity, like the playing of chess, would be best. It can also be maintained that it is best to provide the machine with the best sense organs that money can buy, and then teach it to understand and speak English. This process could follow the normal teaching of a child. Things would be pointed out and named, etc. Again I do not know what the right answer is, but I think both approaches should be tried.

Last Years

- In 1952, he was arrested for homosexuality – which was then illegal in Britain. He was found guilty of 'gross indecency'.
- Forced to choose temporary probation or imprisonment. Avoided the prison sentence by accepting *chemical castration*.
- Because of the conviction, his security clearance was removed.
- In 1954, found dead from cyanide poisoning.

Awards

- Awarded the Order of the British Empire for his work.
- In 2007 a life-size statue was unveiled at Bletchley Park in Buckinghamshire, England.
- Princeton University Alumni Weekly named him the second most significant alumnus in the school's history.
- In 2009 former Prime Minister Gordon Brown apologized to Turing.

Citations

- "Alan Mathison Turing." Bio. A&E Television Networks, 2014. Web. 29 May 2014.
- "Remember Alan Turing When considering the Young Genius of Today." TechWorld Rss. N.p., n.d. Web. 29 May 2014.
- "'The Gay Man Who Saved The World': Bletchley Park Codebreaker Alan Turing To Receive Posthumous Award." The Huffington Post UK. N.p., n.d. Web. 29 May 2014.

"We can only see a short distance ahead, but we can see plenty there that needs to be done."

— Alan Mathison Turing