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1 | Alan Turing (1912-1954)

Alan turing was a mathematition and chyptographer who worked to break German encryption and ciphers during WWI and established a series of theories on algorithmic computability.

1.1 | Work at Combridge Regarding Computability (1936-1938)

Turing crated proof that a "universal computing machine", as defined by specific parametres, could compute any mathematical operation as long as it is algorithmically representable.

Furthermore, he showed that there are no solutions to the base-case decision problem (finding the provability of an theorem based on only axioms in O(1) time) because his "computing machines" could not have a finite state by when they halt.

1.2 | Hut8 (1938-1941)

Turing invented a system to decode German communication ("Enigma") with a rotating weights sytem in the Hut8 program at Bletchley Park; however, Turing did not support the method by which the US navy decided to execute upon codebreaking. His codebreaking efforts, by estimate, shaved 2 years from the war.

He also assisted in creating secured speech systems for the navy.

1.3 | Turing test (1945-1947)

Alan turing became interested the problem with artificial intellingence, and proposed the "turing test" as a way of seggregating AI with humans.

1.4 | Capture, prosecution, and Death (1952-death 1954)

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2 | Context and Science of Turing's Discoveries

Turing's career really spanned three different phases: his work on computability, his coding work at Hut8, and finally his brief stint of interest in artificial intelligence. There are different contexts under which each of these discoveries took place, with the war work being the centrepiece of his claim to international fame.

2.1 | Computability

In the early days of Turing's academic life, he worked in the early beginnings of computer science — then still a form of "mathematics."

As the study of "algorithums" (which evolved to be the foundation of CS) was gaining popularity among mathematitians; Turing published his work on "Computable Numbers" and created hypothetical devices named "turing machines" that would solve any agrothmic problems.

These “turing machines”, and the theory thereof, eventually became the foundations for the definition of a programming language — that any language sufficient to emulate a turing machine will then be capable to solve any algorthimic problem or implement any program.

This, in addition to the lack of solution for the “halting problem” with Turing machines which implies the inability to solve the decision problem, showed the necessity of proofs (that proofs could not be “inferred” and has to be “computed”.)

2.2 | **Hut8**

Under the context of WWII, Turing worked at Government Code and Cypher School, working on the cryptoanalysis of the Enigma machine.

Turing is perhaps best known for his work in the cracking the German Naval Enigma — solving first the naval indicator system by which the enigma machines communicate in 1939 and returning to Blenchley Park in 1943.

Hugh Alexander, the head at Hut8, supposed that Hut8’s sucess is largely attributed to the work of Turing.

Because of his work to break effective German code, Turing likely resulted in the shortening of the war and prevented thousands of deaths.

2.3 | **Turing Test**

After his work at Hut8, Turing retained a government advisory job and started returning to academia in development of early stored-program computers (the ACE: Automatic Computing Engine). However, he was later found guilty of homosectuality and commited… Suiside? or Accidental Poising? shortly thereafter.

With the dawn of computer programs, Turing began exploring the idea of computed intelligence: creating a philosophical “Turing Test” by which one could mark the standard for computed intelligence.

Turing also proposed the idea of self-improving computation, that: its “easier to build a child mind and subject to education than bulding an adult mind”.

The turing test became a fundimental concept in the bourgening field of Artificial intelligence, and the reversed form of the Turing test — the CAPCHA — is widely deployed today.