Historical Background

Alan Turing possibly coined the term "simulation" to describe a universal machine executing a state transition table that itself described the state transitions, inputs and outputs of a (simulated) discrete-state machine. A Turing machine that can simulate any other Turing machine is called a universal Turing machine [1]. The Church–Turing thesis states that Turing machines indeed capture the informal notion of effective method in logic and mathematics, and provide a precise definition of an algorithm or "mechanical procedure" [2].

The history of practical computer simulation began during World War II while John von Neumann and Stanislaw Ulam investigated neutron behavior [3]. Probably the first end-to-end performance simulation of a computer central processing unit (CPU) was constructed by Harwood Kolsky and John Cockeon the IBM Stretch project beginning in August 1957 [4]. By the early 1960s, there were numerous computer simulation efforts under way at IBM and many other companies.

[1] F. C. Hennie and R. E. Stearns. *Two-tape simulation of multitape Turing machines*. JACM, 13(4):533–546, 1966.

[2] http://en.wikipedia.org/wiki/Turing_machine (accessed 25 Feb 2013).

[3] http://www.uh.edu/~lcr3600/simulation/historical.html (accessed 25 Feb 2013).

[4] http://archive.computerhistory.org/resources/text/IBM/Stretch/102636400.txt (accessed 25 Feb 2013).