

THE TURING MACHINE AND WHAT COMPUTERS CAN AND CANNOT DO

A lecture by

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Abstract

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Historic. Hilbert's Decidability Problem. Alan Turing appears. The Turing Machine (TM). Exercises. Characteristics of a TM. Types of TM instructions and its power. The Church-Turing thesis. The universal TM. Can machines have sensations and feelings? Alan Turing and the Decidability Problem. The Halting Problem. Can machines think and be intelligent? The Turing Test and its extensions. The issues of "singularity", man-machine symbiosis and transhumanism. Non-deterministic transitions in a TM and in living beings. How can something non-physical act physically without violating physical laws? Is the human being a machine?