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What "computing" means?

Abstract: The Church-Turing thesis identifies the intuitive concept of what means "to compute" with a formal model of computation. There are multiple models of computation and all of them can be proved to be extensionally equivalent (they capture the same functions, such as "identity", or "the next element of the sequence"). However, despite the extensional equivalence, models differ intensionally (they capture different aspects of computation, for instance computations on abstract natural numbers are intensionally different from computations performed by a machine using concrete electric signals). The main objective of this project is to characterize intensional differences between various concepts of computation.