



METADATA

Title: Computation Theory and Applications

Other Titles: -

Language: Greek

ISBN: 978-960-603-406-0

Subject: MATHEMATICS AND COMPUTER SCIENCE

Keywords: Languages / Automata / Grammars / Computability / Computational Complexity

Bibliographic Reference: Katsaros, P. (2015). Computation Theory and Applications [Undergraduate textbook]. Kallipos, Open Academic Editions. <http://dx.doi.org/10.57713/kallipos-478>

Abstract

Computation Theory was developed to study fundamental questions about the concept of computation and the capabilities of our computing machines. Computation is a physical phenomenon, performed on a closed system we call a computer. Which calculations are feasible and which calculations are impossible? How can we know whether a given problem can be solved and whether it can be done sufficiently quickly? To answer these questions, scientists have been inspired by abstract models of computation, such as recursive functions, calculus- λ , Turing machines, and finite-state machines. The definition of computational models is characterized by a mathematical rigor necessary to prove results that answer the questions posed. The Turing machine, a theoretical machine model proposed by Alan Turing in 1936, has proved to be the most expressive model to date, as it can represent any

computation of a computing machine. Finite-state machines combine the simplicity of computation representation with significant computational expressive capabilities and therefore have many applications in the design and analysis of the behavior of systems such as vending machines, computer games, CPUs and other applications such as text analysis, network protocol analysis and natural language processing. Various extensions of computational models such as those mentioned above also find application in the study of biological systems and embedded systems that interact with the environment in real time. The e-book "Computation Theory and Applications" is an original presentation of the basic results of Computation Theory interspersed with numerous applications from various fields, simulations, evaluation criteria, and extensive multimedia and interactive content.

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