



METADATA

Title: Φυσική των Σημάτων και των Συστημάτων με Προσομοιώσεις και Εφαρμογές

Other Titles: -

Language: Greek

Authors: Nistazakis, E., Professor, UOA, Volos, C., Associate Professor, AUTH

ISBN: 978-618-5667-94-8

Subject: NATURAL SCIENCES AND AGRICULTURAL SCIENCES

Keywords: Theory of signals and systems / Fourier series / Fourier transform / Discrete Fourier transform / Sampling theory

Bibliographic Reference: Nistazakis, E., & Volos, C. (2023). Φυσική των Σημάτων και των Συστημάτων με Προσομοιώσεις και Εφαρμογές [Undergraduate textbook]. Kallipos, Open Academic Editions. <http://dx.doi.org/10.57713/kallipos-119>

Abstract

In this book, an attempt has been made to present and study in detail, the content of the theory of signals and systems in the logic of the "physics of things", in terms of physics that describe their operation. This approach requires the systematic way of introducing definitions and concepts for the essential understanding of natural principles and laws with the aim of avoiding frequent and important misunderstandings. Specifically, the basic concepts and principles of signals and systems that an undergraduate and/or graduate student should know are presented and their key importance in the correct processing of experimental data and the drawing of correct conclusions, in every scientific field, is explained in detail. In addition, the signals as well as the operation of the systems in the field of frequency and time are analyzed in detail, while the implementation of the relevant simulation methods through programming codes, presented in the chapters of the book, is of interest. In

this way, the reader is given the opportunity to understand the theory and the appropriate procedures for the study of signals, as well as in the analysis and synthesis of systems, continuous or discrete time. In each chapter the theory is presented and analyzed, the relevant codes in Matlab which are necessary for the simulations, while several examples are solved analytically with the aim of understanding the applications related to the study of real signals. The citation of the appropriate examples as well as the analytical way of solving them aims to arouse the interest of the student and lead to the consolidation of the theory and the understanding of the design of the simulation codes which can also be implemented in the laboratory. Signals and systems are inextricably linked to applications in Physics and the Positive Sciences, while the relevant conclusions and resulting equations highlight their decisive contribution to drawing correct conclusions through experimentation.

