Ελευθέριος Κοφίδης

ΕΠΕΞΕΡΓΑΣΙΑ ΗΧΟΥ ΚΑΙ ΕΙΚΟΝΑΣ

Μια μη μαθηματική εισαγωγή

METADATA

Title: Audio and Image Processing

Other Titles: A non-mathematical introduction

Language: Greek

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ISBN: 978-618-5726-24-9

Subject: ENGINEERING AND TECHNOLOGY

Keywords: Signal / System / Filter / Audio / Image

Abstract

Audio and image processing, with its variety of applications in the modern world, lies under the umbrella of signal processing, a subject that makes extensive use of mathematics and is commonly presented and taught as such. However, this may discourage or even exclude interested students that may not have or are not interested in acquiring the necessary mathematical knowledge while they are interested mostly in concepts and tools. There appears to be a gap in the Greek literature in this respect, that is attempted to be filled by this book. It aspires to show that math is not necessary in understanding basic mono- and two-dimensional signal processing when audio and image signals are to be processed. Both classical and modern topics and applications are presented, which include digitization of a signal, ways of analyzing it in time/space and/or frequency and use of them in problems of enhancement, restoration and compression of audio/image. In this context, modern machine learning methodologies are also presented, with application including separation of mixed signals and image retrieval from image databases, among others. Examples, both solved and in the form of problems, are provided throughout. This also holds for software tools (based on MATLAB ©) with which the reader can reproduce the examples and create her/his own applications.