Σήματα και Συστήματα

Νικόλαος Ασημάκης / Μαρία Αδάμ

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Abstract

This book is adressed to undergraduate students and its main purpose is to acquire basic knowledge and understanding of basic concepts in Signals and Systems. Teachers and students will find the necessary material to understand and consolidate basic knowledge and concepts related to discrete-time and continuous-time Signals and Systems and will be able to use and program algorithms used in Signals and Systems through Laboratory Exercises. The chapters are: 1. Discrete-time and continuous-time signals 2. Discrete-time and continuous-time signal operations 3. Discrete-time and continuous-time systems 4. Discrete-time Fourier Transformation and Frequency Response 5. z Transformation and Transfer Function 6. Continuous-Time Fourier Transformation and Frequency Response 7. Laplace Transformation and Transfer Function 8. Discrete Fourier Transformation and Fast Fourier Transformation In each chapter there is theory, solved exercises, unsolved exercises, laboratory exercises, summary, bibliography, evaluation criteria. Particular emphasis is placed on the analysis of programming techniques of the basic concepts in Signals and Systems, in a programming environment using software, which have been established in the scientific community: the commercial Matlab software and the Octave software, which is a free and open source clone of the Matlab software. Also, laboratory exercises were designed to acquire the ability to use and program algorithms used in Signals and Systems. Particular emphasis is placed on the elements of multimedia and interaction/interactivity. The multimedia elements include the recorded summaries at the end of each chapter, which help the students listen to the main points of the chapter. Also, the interactivity elements include the assessment criteria at the end of each chapter, as well as student-user friendly techniques, such as radiobuttons , drag&drop so as to give the students the possibility of checking the knowledge acquired. Finally, special interactive software for computing discrete-time signal operations were designed.