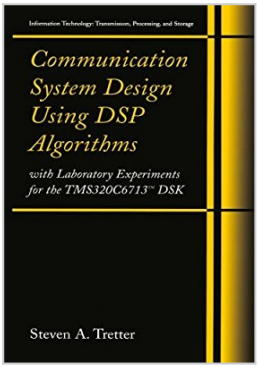

Communication System Design Using DSP Algorithms: With Laboratory Experiments for the TMS320C6713™ DSK (Information Technology: Transmission, Processing and Storage)

By Steven A. Tretter

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Designed for senior electrical engineering students, this textbook explores the theoretical concepts of digital signal processing and communication systems by presenting laboratory experiments using real-time DSP hardware. This new edition updates the experiments based on the TMS320C6713 (but can easily be adapted to other DSP boards). Each chapter begins with a presentation of the required theory and concludes with instructions for performing experiments to implement the theory. In the process of performing the experiments, students gain experience in working with software tools and equipment commonly used in industry.

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Editorial Review

From the Back Cover

Designed for senior electrical engineering students, this textbook explores the theoretical concepts of digital signal processing and communication systems, using practical laboratory experiments with real-time DSP hardware. Originally designed with older Texas Instruments models in mind, this new edition updates the experiments to incorporate the TMS320C6713™ DSK, while remaining relevant for other DSP boards. The C6713™ DSK is now the preferred board in educational DSP labs; this edition stays current with these new changes in the field.

The primary focus of this book is communication systems, including algorithms that are particularly suited to DSP implementation. Software and hardware tools are introduced, as well as FIR and IIR digital filters and the FFT. This book also discusses modulators and demodulators for classical analog modulation methods such as amplitude modulation (AM), double-sideband suppressed-carrier amplitude modulation (DSBSC-AM), single sideband modulation (SSB), and frequency modulation (FM).

The second half of the book explores digital communication methods leading to the implementation of a telephone-line modem. This new edition also incorporates a comprehensive discussion of Orthogonal Frequency Division Multiplexing (OFDM), which is particularly pertinent as the world is heavily turning towards using wireless wideband communication. Methods for adaptive equalization, carrier recovery, and symbol clock tracking are presented as well, with suggestions for additional experiments.

Steven A. Tretter received the BSEE degree from the University of Maryland in 1962 and the PhD degree in Electrical Engineering from Princeton University in 1966. He is currently an Associate Professor in the Department of Electrical and Computer Engineering at the University of Maryland, College Park. His areas of expertise include communication systems, digital signal processing, and error correcting codes. He has been a consultant to several telephone-line modem manufacturers since 1970. Many of the algorithms presented in this book were developed for and are used in commercial DSP-based modems. He is presently a consultant to a group at Texas Instruments in Germantown, MD, creating optimized DSP code for wireless OFDM systems.

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