Digital Signal Processing Techniques and Applications in Radar Image Processing

Bu-Chin Wang

DESCRIPTION

A self-contained approach to DSP techniques and applications in radar imaging

The processing of radar images, in general, consists of three major fields: Digital Signal Processing (DSP); antenna and radar operation; and algorithms used to process the radar images. This book brings together material from these different areas to allow readers to gain a thorough understanding of how radar images are processed.

The book is divided into three main parts and covers:

* DSP principles and signal characteristics in both analog and digital domains, advanced signal sampling, and interpolation techniques

* Antenna theory (Maxwell equation, radiation field from dipole, and linear phased array), radar fundamentals, radar modulation, and target-detection techniques (continuous wave, pulsed Linear Frequency Modulation, and stepped Frequency Modulation)

* Properties of radar images, algorithms used for radar image processing, simulation examples, and results of satellite image files processed by Range-Doppler and Stolt interpolation algorithms
The book fully utilizes the computing and graphical capability of MATLAB® to display the signals at various processing stages in 3D and/or cross-sectional views. Additionally, the text is complemented with flowcharts and system block diagrams to aid in readers' comprehension.

Digital Signal Processing Techniques and Applications in Radar Image Processing serves as an ideal textbook for graduate students and practicing engineers who wish to gain firsthand experience in applying DSP principles and technologies to radar imaging.

ABOUT THE AUTHOR

Bu-Chin Wang has worked as a research engineer in DSP-based data modem design; worked in projects related to speech processing and DSP processor design; and cofounded Summit Micro Design, where he completed projects related to QAM data modem chip set, DSP processor, and various PC-based board-level products. He has been awarded five U.S. patents in fields related to DSP applications, and he currently works as an inventor and entrepreneur in DSP-related areas.

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