Simplified Robust Adaptive Detection and Beamforming for Wireless Communications

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DESCRIPTION

This book presents an alternative and simplified approaches for the robust adaptive detection and beamforming in wireless communications. It adopts several systems models including DS/CDMA, OFDM/MIMO with antenna array, and general antenna arrays beamforming model. It presents and analyzes recently developed detection and beamforming algorithms with an emphasis on robustness. In addition, simplified and efficient robust adaptive detection and beamforming techniques are presented and compared with exiting techniques. Practical examples based on the above systems models are provided to exemplify the developed detectors and beamforming algorithms. Moreover, the developed techniques are implemented using MATLAB—and the relevant MATLAB scripts are provided to help the readers to develop and analyze the presented algorithms.

Simplified Robust Adaptive Detection and Beamforming for Wireless Communications starts by introducing readers to adaptive signal processing and robust adaptive detection. It then goes on to cover Wireless Systems Models. The robust adaptive detectors and beamformers are implemented using the well-known algorithms including LMS, RLS, IQRD-RLS, RSD, BSCMA, CG, and SD. The robust detection and beamforming are derived based on the existing detectors/beamformers including MOE, PLIC, LCCMA, LCMV, MVDR, BSCMA, and MBER. The adopted cost functions include MSE, BER, CM, MV, and SINR/SNR.
ABOUT THE AUTHOR

Ayman Elnashar, PhD, has 20+ years of experience in the telecoms industry, including 2G/3G/LTE/WiFi/IoT/5G/Wireless Networks. He was part of three major start-up telecom operators in the MENA region (Orange/Egypt, Mobily/KSA, and du/UAE). Currently, he is Head of Core and Cloud planning with the Emirates Integrated Telecommunications Co. "du", UAE. He is the founder of the Terminal Innovation Lab and UAE 5G Innovation Gate (U5GiG). Prior to this, he was Sr. Director # Wireless Networks, Terminals and IoT, where he managed and directed the evolution, evaluation, and introduction of du wireless networks, terminals and IoT, including LTE/LTE-A, HSPA+, WiFi, NB-IoT, and is currently working towards deploying 5G network in the UAE.

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