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| Nota di bibliografia    | Includes bibliographical references at the end of each chapters and index.  |
| Nota di contenuto       | Front Cover; Cooperative and Cognitive Satellite Systems; Copyright ; Contents; List of contributors; Preface; Cooperative and cognitive satellite systems; 1 Introduction; 1.1 Cooperative Satellite Systems; 1.2 Cognitive Satellite Systems; About the Editors; List of figures; Acronyms; Chapter 1: Multibeam joint detection; 1.1 Introduction; 1.1.1 Signal description; 1.1.1.1 Beam radiation pattern; 1.1.1.2 Fading; 1.1.2 Overview of multibeam techniques; 1.2 Theoretical performance limits; 1.2.1 Sum rate; 1.2.1.1 High SNR; 1.2.1.2 Low SNR; 1.2.1.3 Numerical example; 1.2.2 Outage capacity<br>1.2.2.1 High SNR<br>1.2.2.2 Numerical example; 1.3 Multibeam processing: linear and nonlinear joint detection; 1.3.1 Joint detection algorithms; 1.3.1.1 Linear detectors; 1.3.1.2 Nonlinear detectors; 1.3.1.3 Numerical example; 1.3.2 IDD Techniques; 1.3.3 Complexity considerations; 1.4 Practical impairments; 1.4.1 Imperfect channel estimation; 1.4.1.1 Review on channel estimation techniques; 1.4.1.2 Asynchronism in the return link; 1.4.1.3 Performance with imperfect channel estimation; 1.4.2 Limitations of the feeder link; 1.5 Conclusions; References<br>Chapter 2: High-performance random access schemes<br>2.1 Introduction; 2.2 Key terrestrial RA techniques; 2.3 RA Techniques for satellite |

networks; 2.3.1 Slotted RA techniques; 2.3.1.1 From (diversity) slotted ALOHA to CRDSA; 2.3.1.2 CRDSA practical implementation issues; 2.3.1.3 Review of other slotted RA techniques for satellite; 2.3.2 Unslotted RA techniques; 2.3.2.1 Enhanced SSA; 2.3.2.2 MMSE plus ESSA; 2.3.2.3 Asynchronous contention resolution diversity ALOHA; 2.3.2.4 Unslotted RA implementation aspects; 2.3.3 Congestion control in RA; 2.4 RA Capacity  
2.4.1 Capacity bounds for spread-spectrum RA; 2.4.2 Capacity bounds for non-spread-spectrum RA; 2.5 Systems and standards; 2.6 Summary and future research perspectives; References; Chapter 3: Multibeam joint precoding: frame-based design; 3.1 Introduction; 3.1.1 Precoding and beamforming in the satellite context; 3.1.2 Precoding over satellite: a standardization perspective; 3.1.3 Practical considerations; 3.1.4 Frame-based precoding: a multigroup-multicast approach; 3.2 System and channel model; 3.2.1 Multicast channel model; 3.2.2 Equivalent channel model; 3.2.3 Multibeam satellite channel  
3.2.4 Payload phase errors; 3.2.4.1 Sensitivity to phase offsets; 3.2.4.2 Imperfect CSI estimation; 3.2.4.3 Outdated CSI; 3.2.5 Feeder link; 3.3 Frame-based precoding design; 3.3.1 Unicast multibeam precoding; 3.3.2 Block-SVD precoding; 3.3.3 Heuristic multicast aware MMSE precoding; 3.3.4 Optimal multigroup multicast precoding; 3.4 User selection for frame-based precoding; 3.4.1 Maximum channel norm selection; 3.4.2 Scheduling based on geographic user clusters; 3.4.2.1 Geographic user clustering; 3.4.3 Semi-parallel user selection; 3.4.4 Multicast aware user scheduling  
3.5 Performance evaluation of selected methods

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## Sommario/riassunto

Cooperative and Cognitive Satellite Systems provides a solid overview of the current research in the field of cooperative and cognitive satellite systems, helping users understand how to incorporate state-of-the-art communication techniques in innovative satellite network architectures to enable the next generation of satellite systems. The book is edited and written by top researchers and practitioners in the field, providing a comprehensive explanation of current research that allows users to discover future technologies and their applications, integrate satellite and terrestrial systems

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