Cognitive Radio and Dynamic Spectrum Access
Lars Berlemann, Stefan Mangold

**DESCRIPTION**

*Cognitive Radio for Dynamic Spectrum Access* gives a comprehensive overview of the main concepts behind radio spectrum regulation, dynamic spectrum access and cognitive radio. Spectrum measurements are introduced to illustrate the inefficiencies in today’s spectrum usage and the book also discusses enablers for horizontal and vertical spectrum sharing. Among others a game-theory-based approach for spectrum sharing is described and evaluated. Institution and standardisation approaches in academic research and industry are highlighted including IEEE SCC41, 802.11k/n/s/y and 802.22 which lead towards commercial exploitation of cognitive radio. In conclusion, this book looks at the initial steps towards the vision of true cognitive radio and the potential impact on telecommunication business.

- Introduces the benefits and challenges of cognitive radio
- Presents cognitive radio in research and industry and covers implications for operators from the perspective of a telecom operator
- Examines how cognitive radio techniques will considerably change the wireless communication market.

**ABOUT THE AUTHOR**

Lars Berlemann and Stefan Mangold both contribute to research programs, standardization and industry innovations in the field of dynamic spectrum access, cognitive radio, and IEEE 802 standards. Together they have filed numerous journal and magazine
articles, patents, and contributions to research conferences and workshops. They both consult government organizations such as the European Commission in steering related research programs.

Lars Berlemann and Stefan Mangold have been delivering tutorials on cognitive radio at various research conferences such as IEEE PIMRC and the European Wireless Conference. As alumni from RWTH Aachen University, Germany, Lars Berlemann and Stefan Mangold graduated at the Chair of Communication Networks, ComNets, with Professor Bernhard H. Walke as PhD advisor. Their PhD theses (both awarded summa cum laude) are today considered to be important early research contributions to the field and are in the highest ranks in the number of downloads from the University’s download servers. Together with Professor Walke, Drs Berlemann and Mangold coedited the Wiley book *IEEE 802 Wireless Systems: Protocols, Multi-Hop Mesh/Relaying, Performance and Spectrum Coexistence* which was published in November 2006.

Lars Berlemann is product manager in the product and innovation department of Deutsche Telekom, Germany. Stefan Mangold is manager at Swisscom, Switzerland, leading the access team of the product IT development group of Swisscom Network & IT. They both work for companies that operate mobile, fixed, and broadcast networks, and in addition provide services with excellent customer focus. Consequently, Drs Berlemann and Mangold understand and exploit the synergies between academic research focusing on excellence, and industry innovations focusing on commercial exploitation.

Lars Berlemann and Stefan Mangold share and disseminate what they learn. In parallel with their employment, they enjoy working with students. Lars Berlemann is guest lecturer at the Chair of Communication Networks, Technical University of Dortmund, Germany. Stefan Mangold is with ETH Zurich, Switzerland, Department of Computer Science, where he works as lecturer and visiting scientist. In addition to his scientific engineering background, Lars Berlemann holds a diploma in Business and Economics from RWTH Aachen. The comments and statements made in this book are from the authors and do not necessarily reflect the official position of their employers.

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