Multimedia over Cognitive Radio Networks: Algorithms, Protocols, and Experiments

By Fei Hu, Sunil Kumar

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With nearly 7 billion mobile phone subscriptions worldwide, mobility and computing have become pervasive in our society and business. Moreover, new mobile multimedia communication services are challenging telecommunication operators. To support the significant increase in multimedia traffic?especially video?over wireless networks, new technological infrastructure must be created. Cognitive Radio Networks (CRNs) are widely regarded as one of the most promising technologies for future wireless communications. This book explains how to efficiently deliver video, audio, and other data over CRNs.

Covering advanced algorithms, protocols, and hardware-/software-based experiments, this book describes how to encode video in a prioritized way to send to dynamic radio links. It discusses different FEC codes for video reliability and explains how different machine learning algorithms can be used for video quality control. It also explains how to use readily available software tools to build a CRN simulation model.

This book explains both theoretical and experimental designs. It describes how universal software radio peripheral (USRP) boards can be used for real-time, high-resolution video transmission. It also discusses how a USRP board can sense the spectrum dynamics and how it can be controlled by GNU Radio software. A separate chapter discusses how the network simulator ns-2 can be used to build a simulated CRN platform.

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Multimedia over Cognitive Radio Networks: Algorithms, Protocols, and Experiments By Fei Hu, Sunil Kumar Bibliography

- Sales Rank: #4958531 in Books
- Published on: 2014-12-04
- Original language: English
- Number of items: 1
- Dimensions: 10.00" h x 1.20" w x 7.00" l, .0 pounds
- Binding: Hardcover
- 492 pages

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Editorial Review

About the Author

Dr. Fei Hu is currently an associate professor in the Department of Electrical and Computer Engineering at the University of Alabama, Tuscaloosa, Alabama. He obtained his PhD at Tongji University (Shanghai, China) in the field of signal processing (in 1999) and at Clarkson University (Potsdam, New York) in electrical and computer engineering (in 2002). He has published more than 160 journal/conference papers and books. Dr. Hu's research has been supported by U.S. National Science Foundation, Cisco, Sprint, and other sources. His research expertise can be summarized as 3S: Security, Signals, Sensors.

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