

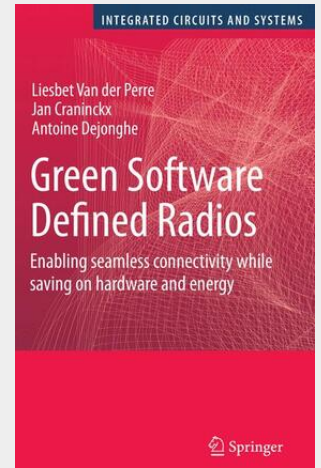
Green Software Defined Radios

Enabling Seamless Connectivity While Saving on Hardware and Energy

Green Software Defined Radios, the title of this book may have originated from a lack of inspiration, and the combination of hard work, jetlag, and drinking green tea. The message we want to convey however, is that SDRs are a promising technology for the future, providing they are designed for efficient usage of scarce resources: energy and spectrum. In the last years, the R&D teams focusing on wireless communication (around the world and at IMEC specifically), have realized great breakthroughs. It is our honor, building on this knowledge, to bring a comprehensive overview of the essential technologies. We are grateful that Springer is willing to publish in their collection on radio technologies, a book on green SDRs, a weird species still today, yet maybe the baseline for the day after tomorrow. Dear reader, we wish that you find in the following pages, including the references, some interesting insights, and that this book may live more or less up to your expectations (and hopefully more than less).

This book's closing states that the quest for Green SDRs has not ended, this is just the beginning. Concerning this book however, we are happy that today the opposite is true. We want to acknowledge our colleagues at IMEC for their great scientific contribution, and even more for the enjoyable cooperation.

The increasing need for functional flexibility (the number of wireless standards is large and expected to grow) and the exploding cost of system-on-chip design will make implementation of wireless standards on reconfigurable radios the only viable option in the future. Software Defined Radios (SDRs) will offer higher flexibility at lower cost. Moreover, they are key enablers in the realization of cognitive radios, which will enable more efficient use of network and spectral resources. Green SDRs will be essential, to save on crucial and scarce resources: energy and spectrum. Green Software Defined Radios gives insight in the trends asking for green SDRs. The essential ingredients of these radios are elaborated on. Specifically, design solutions and approaches for energy-scalable SDRs, both for the radio front-end and the digital baseband (including hardware and software), are explained. Intelligent (cross-layer) control is introduced as the key to achieve energy efficient operation and seamless connectivity. Last but not least the book focuses on cognitive radios, opening a new wireless order. These radios build on SDR platforms, enhanced with a sensing engine and intelligent control.



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