

Indoor Wireless Communications

From Theory to Implementation

ALEJANDRO ARAGÓN-ZAVALA



WILEY

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Alejandro Aragón-Zavala

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Lefis, Co, Oji and Fimbie, finally this is done. Thanks for keeping me up and running in this project. I could have not done it without your support, especially at those times of difficulties. I entirely dedicate this to you, Arafra.

Alejandro Aragón-Zavala

Preface

It all started in my early days of PhD work at the University of Surrey, UK. I remember that on my first year and while searching for literature related to in-building radio systems, to my surprise, there was not any book available on indoor radio networks at the time. I had quick chats with some of my professors and co-students to see if they have seen anything related at all; the answer was the same in all cases: there is nothing out there – only papers and articles, that was all.

Later on and while working at Cellular Design Services, I again needed to search for some reference material as we were in the middle of a very large project related to wireless infrastructure in airports. The only things I could find were chapters in some books, which had scattered information and was a jig-saw puzzle task to put all the pieces together. That is where I had the very first idea of having a single book that could cover all indoor radio aspects in a simple but useful way.

On my return to Mexico, I finally decided to start working on producing a book that could fulfil all the needs from an engineer or specialist willing to work on in-building radio design, covering many aspects of what I had learnt both in research and in industry.

This book includes materials and knowledge acquired after many years of experience and hard work in the field of indoor wireless communications. It goes from the very basics of building characteristics and ‘things to look at’ when designing a radio network in a certain type of building to more sophisticated propagation models, capacity calculations and a chapter on case studies that covers practical aspects of real indoor designs.

I believe this book can be very useful as a practical reference for scientists and engineers involved in the design, planning and operational aspects of new infrastructures for wireless communication systems inside buildings, a field that is growing very rapidly around the world. It could also be used as a text for graduate students or final year undergraduates willing to expand their knowledge in the field of in-building radio systems.

I am solely responsible not only for technical inaccuracies but also for typos. I would appreciate any feedback to aaragon@itesm.mx, where comments, corrections or recommendations are welcome. An errata file will be kept and sent to anyone interested, upon request.

First of all, I would like to thank Prof. Simon R. Saunders for all his help and support during the writing of this book and for taking the time to contribute to the Small Cells chapter. In particular, thanks Simon for your friendship all these years and for your valuable guidance.

I also like to thank Dr Vladan Jevremovic for contributing to the Case Studies chapter and for sharing those valuable calls where we discussed key aspects of what is going on in the indoor wireless industry.

Thanks to all the iBwave Solutions Inc. team for their help, in particular to Dr Ali Jemmali, Benoit Courchese, Dominique Gauthier and Peter Thalmeir. I have learnt much from you – the experts in in-building radio design!

I wish to thank the support received by Tecnológico de Monterrey, Campus Querétaro and Campus Monterrey authorities and especially thanks to Dr Héctor Morelos-Borja, Dr David Muñoz-Rodríguez and Dr Manuel I. Zertuche. Special thanks also to all my graduate students who helped me during the elaboration of this work and for those who have shared with me useful discussions after lectures.

A very special group of people who helped me with bits and pieces of this book throughout the years is that from Real Wireless Ltd. Thanks to Mark Keenan, Kostas Konstantinou and Julie Bradford; we have worked in many really interesting in-building projects from which you have shared the best of your knowledge and attitude with me.

This book is dedicated to all my students, both graduate and undergraduate, from Tecnológico de Monterrey, Campus Querétaro; you are truly my inspiration and my motor to keep myself updated.

Finally, I wish to thank the valuable support from John Wiley & Sons editorial team, especially to Mark Hammond, Tiina Wigley, Ashmita Thomas Rajaprathapan, Sarah Tilley, Susan Barclay, Victoria Taylor, Liz Wingett and Sandra Grayson, for all their patience, enthusiasm and support given to me throughout these years. Thanks for always keeping a nice smile and encouraging comments!

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Dr Alejandro Aragón-Zavala

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