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## Preface

In the past few years we have written and edited several books in the area of acoustic and speech signal processing. The reason behind this endeavor is that there were almost no books available in the literature when we first started while there was (and still is) a real need to publish manuscripts summarizing the most useful ideas, concepts, results, and state-of-the-art algorithms in this important area of research. According to all the feedback we have received so far, we can say that we were right in doing this. Recently, several other researchers have followed us in this journey and have published interesting books with their own visions and perspectives.

The idea of writing a book on *Microphone Array Signal Processing* comes from discussions we have had with many colleagues and friends. As a consequence of these discussions, we came up with the conclusion that, again, there is an urgent need for a monograph that carefully explains the theory and implementation of microphone arrays. While there are many manuscripts on antenna arrays from a narrowband perspective (narrowband signals and narrowband processing), the literature is quite scarce when it comes to sensor arrays explained from a truly broadband perspective. Many algorithms for speech applications were simply borrowed from narrowband antenna arrays. However, a direct application of narrowband ideas to broadband speech processing may not be necessarily appropriate and can lead to many misunderstandings. Therefore, the main objective of this book is to derive and explain the most fundamental algorithms from a strict broadband (signals and/or processing) viewpoint. Thanks to the approach taken here, new concepts come in light that have the great potential of solving several and very difficult problems encountered in acoustic and speech applications.

This book is especially written for graduate students and research engineers who work on microphone arrays. Our goal is to make the area of microphone array signal processing theory and application available in a complete and self-contained text. We attempt to explain the main ideas in a clear and rigorous way so that the reader can have a pretty good idea of the po-

tentials, opportunities, challenges, and limitations of microphone array signal processing. We hope that the reader will find it useful and inspiring.

Finally, we would like to thank Christoph Baumann, Petra Jantzen, and Carmen Wolf from Springer (Germany) for their wonderful help in the preparation and publication of this manuscript. Working with them is always a pleasure and a wonderful experience.

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