



# Head-Related Transfer Function and Virtual Auditory Display

By Bosun Xie

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## Head-Related Transfer Function and Virtual Auditory Display By Bosun Xie

This book systematically details the basic principles and applications of head-related transfer functions (HRTFs) and virtual auditory display (VAD), and reviews the latest developments in the field, especially those from the authors own state-of-the-art research group.

In this updated second edition, **Head-Related Transfer Function and Virtual Auditory Display** covers binaural hearing and the basic principles, experimental measurements, computation, physical characteristics analyses, filter design, and customization of HRTFs. It also details the principles and applications of VADs, including headphone and loudspeaker-based binaural reproduction, virtual reproduction of stereophonic and multi-channel surround sound, binaural room simulation, rendering systems for dynamic and real-time virtual auditory environments, psychoacoustic evaluation and validation of VADs, and a variety of applications of VADs.

### Key Features:

- Discusses and summarizes the basic principles and applications of head-related transfer functions and virtual auditory display
- Reviews the frontiers and latest approaches (modeling, calculations, rendering/display) in HRTF and VAD, useful for researchers, graduate students, and engineers in the field
- Applications from this research can be found in engineering, communications, multimedia, consumer electronic products, and entertainment
- More than 600 references are listed, encompassing the majority of literature in this field

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## **Editorial Review**

### **Review**

This book provides a thorough and comprehensive analysis of issues relevant to HRTFs. Many of them have not been covered in such a detailed, clear way in any other book. Professor Xie has devoted a considerable amount of time and effort creating a work that appeals to readers demands. The international acoustical community will be pleased to have access to its important scientific and technological content, now available with this English translation. --**Jens Blauert**, Internationally renowned expert in spatial hearing

### **From the Inside Flap**

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### **About the Author**

**Bosun Xie** received a Bachelor degree in physics in 1982 and a Master of Science degree in acoustics from South China University of Technology in 1987. In 1998, he received a Doctor of Science degree in acoustics from Tongji University. Since 1982, he has been working at the South China University of Technology and is currently the Director and a professor at the Acoustic Laboratory at the School of Science. Xie is also a member of The State Key Lab of Subtropical Building Science. His research interests include binaural hearing, spatial sound, acoustic signal processing, and room acoustics. He has published over 150 scientific papers and owns 5 patents in these fields. Professor Xie is a member of the Audio Engineering Society (AES), a vice-chairman of the China Audio Engineering Society, and a committee member of the Acoustical Society of China.

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