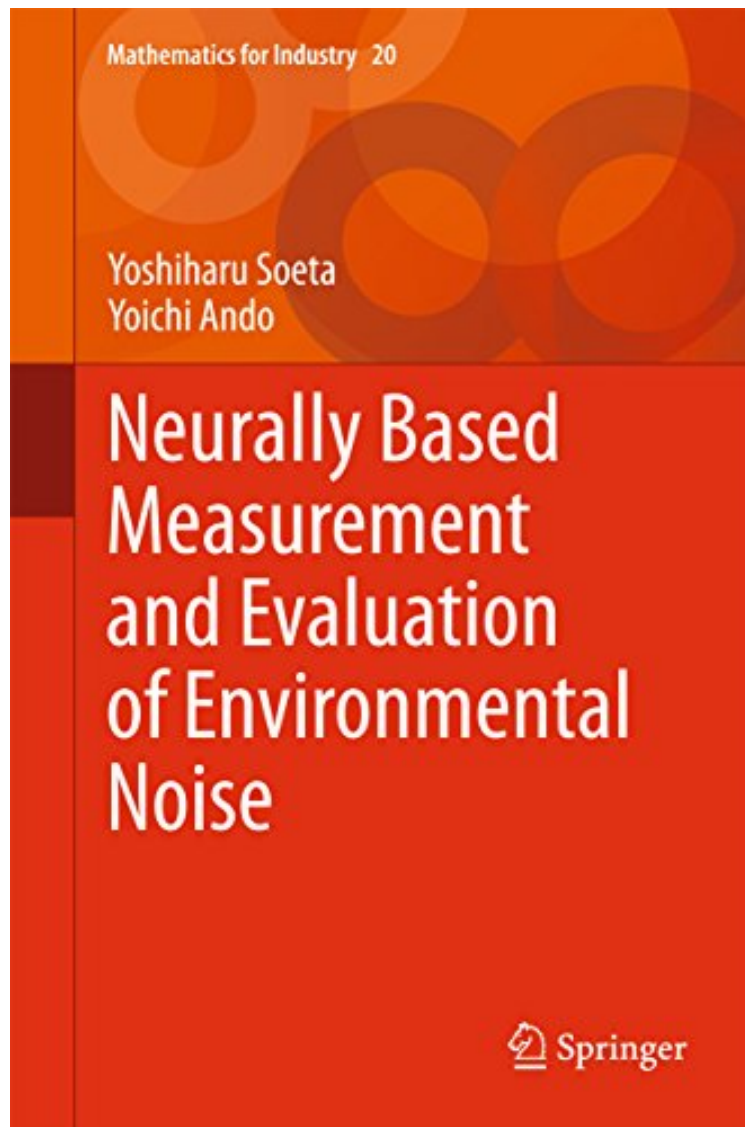


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Neurally Based Measurement and Evaluation of Environmental Noise (Mathematics for Industry)

Yoshiharu Soeta, Yoichi Ando

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Grenier MD PhD This is a remarkable book concerning the EEG, EVP, and Psychophysics of human hearing and the human volunteer of psychophysics in the auditory system in general. The computational and mathematical modeling of loudness, pitch, frequency neuroprocessing of externally induced noise is derived in many ways. Detailed EEG montages of the neural pathways responsible for human perception is explained including: , ears, auditory canal, cochlea, auditory cranial nerve, inferior colliculus, lateral lemniscus, medial geniculate nucleus, and auditory cortex. There are spatiotemporal modeling of EVPs with physiological and suprphysiological thresholds explored. The book has outstanding line drawings, graphs, charts, and trends depicting the nature of noise measurements and processing of the central nervous system physiology including BAEPs, and cortical excitability. This is a great book about noise physiology and auditory psychophysics for students, research fellows, researchers, audiologists, and experimental sensory physiologists. Illustrations and graphs are from front to back numbering in the 100s. This is a good desk reference for audition researchers.

This book deals with methods of measurement and evaluation of environmental noise based on an auditory neural and brain-oriented model. The model consists of the autocorrelation function (ACF) and the interaural cross-correlation function (IACF) mechanisms for signals arriving at the two ear entrances. Even when the sound pressure level of a noise is only about 35 dBA, people may feel annoyed due to the aspects of sound quality. These aspects can be formulated by the factors extracted from the ACF and IACF. Several examples of measuring environmental noise—from outdoor noise such as that of aircraft, traffic, and trains, and indoor noise such as caused by floor impact, toilets, and air-conditioning—are demonstrated. According to the noise measurement and evaluation, applications for sound design are discussed. This book provides an excellent resource for students, researchers, and practitioners in a wide range of fields, such as the automotive, railway, and electronics industries, and soundscape, architecture, and acoustics.

“This book gives a detailed overview of the achievements in the evaluation of noise based on the subjective preference theory. It gives, however, a complete overview of the state of the art on this subject being most relevant to students and scientists working in the field of auditory models.” (Heinrich Metzen, Noise Control Engineering Journal, Vol. 64 (5), September-October, 2016)

“This is a remarkable book concerning the EEG, EVP, and Psychophysics of human hearing and the human volunteer of psychophysics in the auditory system in general. This is a great book about noise physiology and auditory psychophysics for students, research fellows, researchers, audiologists, and experimental sensory physiologists. This is a good desk reference for audition researchers.” (Joseph J. Grenier, .com, July, 2015)

From the Back Cover This book deals with methods of measurement and evaluation of environmental noise based on an auditory neural and brain-oriented model. The model consists of the autocorrelation function (ACF) and the interaural cross-correlation function (IACF) mechanisms for signals arriving at the two ear entrances. Even when the sound pressure level of a noise is only about 35 dBA, people may feel annoyed due to the aspects of sound quality. These aspects can be formulated by the factors extracted from the ACF and IACF. Several examples of measuring environmental noise—from outdoor noise such as that of aircraft, traffic, and trains, and indoor noise such as caused by floor impact, toilets, and air-conditioning—are demonstrated. According to the noise measurement and evaluation, applications for sound design are discussed. This book provides an excellent resource for students, researchers, and practitioners in a wide range of fields, such as the automotive, railway, and electronics industries, and soundscape, architecture, and acoustics.

About the Author Yoshiharu Soeta: Board member of Acoustical Society of Japan in Kansai Branch, Assistant editor of Journal of Temporal Design in Architecture and the Environment, Ad-hoc reviewer of Journal of the Acoustical Society of America, Journal of Sound and Vibration, Noise Control Engineering Journal, Journal of Neurophysiology, and NeuroImage. Yoichi Ando: A series editor of “Modern Acoustics and Signal Processing”, <http://www.springer.com/series/3754> Editor-in-Chief of Journal of Temporal Design in Architecture and the Environment, Ad-hoc reviewer of Journal of the Acoustical Society of America, Journal of Sound and Vibration, and Acta Acustica united with Acustica.