



sensors

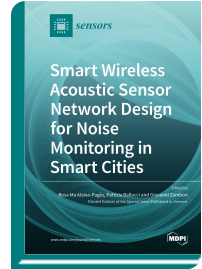


Special Issue Reprint

Smart Wireless Acoustic Sensor Network Design for Noise Monitoring in Smart Cities

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The Environmental Noise Directive (END) requires that a five-year updating of noise maps is carried out to check and report on the changes that have occurred during the reference period. The updating process is usually achieved using a standardized approach consisting of collecting and processing information through acoustic models to produce the updated noise maps. This procedure is time consuming and costly, and has a significant impact on the financial statement of the authorities responsible for providing the maps. Furthermore, the END requires that easy-to-read noise maps are made available to the public to provide information on noise levels and the subsequent actions to be undertaken by local and central authorities to reduce noise impacts. In order to update the noise maps more easily and in a more effective way, it is convenient to design an integrated system incorporating real-time noise measurement and signal processing to identify and analyze the noise sources present in the mapping area (e.g., road traffic noise, leisure noise, etc.) as well as to automatically generate and present the corresponding noise maps. This wireless acoustic sensor network design requires transversal knowledge, from accurate hardware design for acoustic sensors to network structure design and management of the information with signal processing to identify the origin of the measured noise and graphical user interface application design to present the results to end users. This book is collection in which several views of methodology and technologies required for the development of an efficient wireless acoustic sensor network from the first stages of its design to the tests conducted during its final performance, and possible subsequent implications for authorities in the definition of policies. Contributions include several LIFE and H2020 projects design and implementation of intelligent acoustic sensor networks with a focus on the publication of good practices for the design and deployment of intelligent networks in other locations.



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