iemn
Institut d'Electronique, de Microélectronique et de Nanotechnologie
UMR CNRS 8520

Master and Engineer Internship: 2018-2019

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Title : Context identification and environmental noise recognition

Abstract :

One of the main concern of European Policy (2002/49/CE) is to reduce or prevent undesired noise in dense urban area. This directive aims at defining noise indicator, evaluation methods, the definition of noise maps. Thus many research works have been dedicated to measure and predict noise maps based on long-time analysis. Current research activities tends to go beyond noise mapping and to estimate urban noise dynamically and also to predict or planify the noise levels in urban areas.

One of the main objective of the this training is to develop an expert system based on both signal processing and neuronal networks in order to identify the environmental scene and the structural noise. The expert system aims at understanding and identify unstructured environment. Different signal processing technique (time analysis, frequency, time-frequency, energy) for the environmental analysis and noise reduction can compared. Once, the environmental scene identified, a classification step can be foreseen. For example, the noise generated by the urban traffic; the type and the number of vehicules can be estimated by using automatic noise recognition (ANR) system and deep neural network. Finally, the last stage should be a predictive phase in order to estimate the noise levels foreseen or noise cartography. The methods developped during the training can be transfered to Wavely a start-up lodged at IEMN.