Review on the "Audio Signal Processing for dynamic Noise Mapping in Smart City"

Nowadays, the noise pollutions around us have already become a serious problem that disturb us badly. Professor Francesc Alías' work has shown us a dynamic noise mapping system by building low cost sensors networks, which can detect and represent the acoustic impact of road infrastructures in real time.

In Professor Francesc Alías' work, he has developed a methodology that can remove the ANE (Anomalous Noise Events which is unrelated to RTN) out from RTN (Road Traffic Noise) by considering both SNR (Signal-to-Noise Ratio) and the duration of ANE. Professor Francesc Alías' work successfully distinguishes the RTN and ANE. He studies the influences of ANE on RTN L_{Aeq}.The result shows that both SNR and the duration are key variables. And he finds the minimum values of SNR and duration that we should consider to remove the ANE out from RTN, so we can exclusively monitor the impacts of RTN. In order to achieve this goal, he has introduced machining learning into his work. The procedure is that we firstly extract the features of the audio inputs and build the audio database. Then we can use machining learning to train the system by providing it with kinds of sounds. After finishing training, we can build the sound model. The last step is to test the sound model that whether it can classify the sounds. If the model we have built can do the classification, then we can apply it to separate RTN and ANE. Professor Francesc Alías has applied this work in Milan(Urban) and Rome(Suburban), which have different characteristics.

Professor Francesc Alías' work is meaningful. Because his work not only has presented an effective way to make us be possible to study the RTN individually, but also has shown us the achievements of its applications, the noise mapping system, in Milan and Rome. I am very glad that I came to this seminar even though I had never studied this area before. It's very impressive.