Dick Botteldooren is a full professor at Ghent University where he leads research on Acoustics and teaches a variety of courses related to sound and computational methods. He obtained a MSc degree in Electronic Engineering in 1986 from Ghent University and a PhD in Applied Science in 1990 from Ghent University. In 1992 he became interested in acoustics and in particular environmental sound. Dick Botteldooren is currently the president of the European Acoustics Association. Between 2004 and 2013 he was the Editor-in-Chief of Acta Acustica united with Acustica, the journal of the European Acoustics Association. Until 2018 he was the president of the Belgian Acoustical Society; between 2015 and 2018 he was I-INCE vice-president for Europe and Africa. He is a fellow of the Acoustical Society of America and the Institute of Acoustics and Vibration. Dick Botteldooren has made research contributions in the field of acoustic modeling, noise mapping, environmental sensor networks, computational intelligence, modeling perception of environmental sound, health impacts of sound, biomonitoring, urban sound planning, soundscapes, and noise policy support. This work was reported in over 200 journal publications and several hundred conference contributions. Based on his expertise he was an advisor for national and international health councils, and noise policy makers.

How AI Could Find its Way Into Modelling and Measuring for Environmental Sound

This presentation delves into the burgeoning realm of artificial intelligence (AI) and its transformative impact on the management of environmental sound. While the immediate application of AI in recognizing sound sources for environmental sound measurements may be the first thought that comes to mind, this presentation will illuminate its broader potentials. Beyond routine applications, AI, when coupled with geographical information, has the capacity to decipher individuals' expectations regarding the soundscape of a specific location based on their prior knowledge of the environment. Leveraging large language models, such as ChatGPT, in tandem with geographic data, emerges as a pivotal approach in this exploration. Moreover, recognizing the pivotal role of the environment and associated expectations in shaping one's perception of a soundscape—whether it be relaxing, stimulating, or annoying—AI can now predict these appraisals by the users of a given space. This novel application opens avenues for tailoring acoustic environments to meet specific user preferences.

Additionally, the integration of surrogate models, rooted in machine learning approximations of sound propagation physics or traffic dynamics, enables the rapid prediction of noise levels at specific locations—offering efficiency gains orders of magnitude faster than traditional alternatives. Through illuminating examples, this presentation aims to kindle interest in this emerging interdisciplinary field, fostering a collective enthusiasm for future research endeavors.

[this abstract was reformulated for scientific and appealing style by ChatGPT3.5]

FYI: Original Text

In this talk, I will explore the opportunities offered by the recent boom in artificial intelligence (AI) for triggering innovation in the way we handle environmental sound. Recognition of sound sources while measuring environmental sound probably springs to mind first and such straight forward application are becoming indispensable in monitoring networks. But AI can also explore the expectations that a person may have concerning the soundscape of a place based on prior knowledge of the environment. Large language models like ChatGPT combined with geographical information can play an important role in this. Moreover, as the environment and the expectations it evokes plays a crucial role in assessing the appraisal of a sound environment as relaxing, stimulating, or annoying, AI can now also be used to predict this appraisal by the users of the space. Finally, surrogate models based on machine learning approximations of the physics of sound propagation or the dynamics of traffic, allow to predict noise levels at a certain location several orders of magnitude faster than classical alternatives. With these examples, I hope to trigger an interest in this new area and boost its future research.