

In celebration of:



Urban Noise Webinar Series

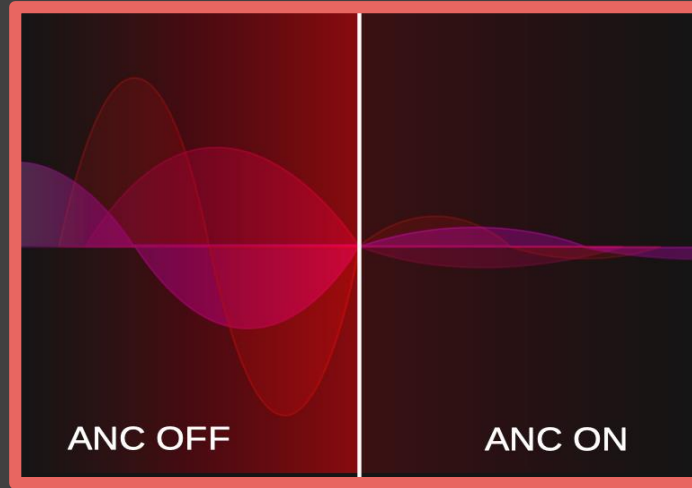
Digitalisation of Urban Noise Sensing, Noise Control and Soundscape Technologies



SESSION 1: Sensing of Noise Sources and its Applications in Urban Environment

- Noise Source Identification and Control of Pedestrian Warning Sounds in Electric Vehicles
Prof. Steve Elliott, University of Southampton, UK
- Audio Intelligence Monitoring at the Edge (AI-ME) in Urban Environment.
Prof. Woon-Seng Gan, Nanyang Technological University, Singapore

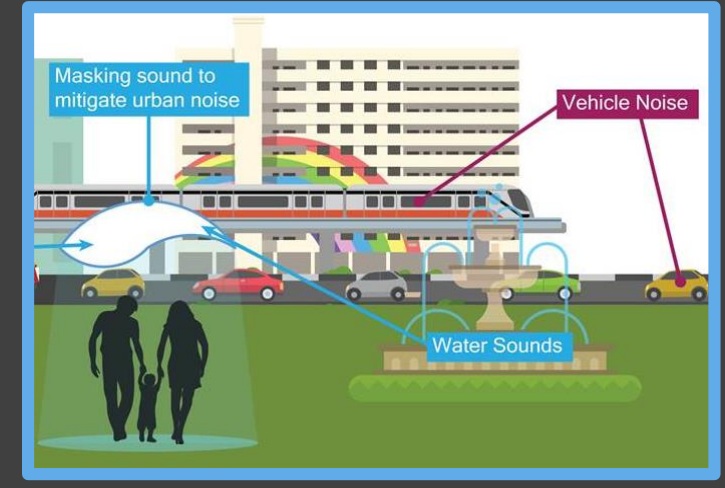
17 August 2020, Monday
3.00pm to 4.30pm



SESSION 2: Application of Active Noise Control (ANC) to Building and Construction

- A Trial of Mitigating Floor Impact Noise by ANC technique and other ANC Topics in the Construction Field
Prof. Masaharu Nishimura, N.Lab, Machinery Noise Consulting, Japan
- Active Noise Control and its Application for Mitigating Noise through Open Window
Prof. Woon-Seng Gan, Nanyang Technological University, Singapore

18 August 2020, Tuesday
3.00pm to 4.30pm



SESSION 3: Soundscape and the Role of Virtual, Augmented, and Mixed Reality in its Design and Implementation

- Soundscape Design: Beyond Quietness
Asst. Prof. Joo Young Hong, Singapore University of Technology and Design, Singapore
- Virtual, Augmented and Mixed Reality for Soundscape Evaluation and Design,
Dr. Bhan Lam, Nanyang Technological University, Singapore

19 August 2020, Wednesday
3.00pm to 4.30pm



JOIN THE WEBINAR FOR FREE NOW!

You may sign up for any one or all of the 3 webinar.

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Urban Noise Webinar Series

Sensing of Noise Sources and its Applications in Urban Environment

Date: 17 August 2020, Monday

Time: 3pm to 4.30pm

Webinar will be conducted on Zoom

[Register Here](#)



Synopsis of Talk #1: Noise Source Identification and Control of Pedestrian Warning Sounds in Electric Vehicles

The move towards electric vehicles presents several challenges for urban noise. Since the powertrain is so quiet, the noise generated by the tyres interacting with the road becomes the most dominant component of the noise in electric vehicles and there is thus a need for better characterisation of this tyre noise. After a general introduction, the first part of this talk will focus on a novel method of characterising the acoustic source strength of the rolling tyre, using sparse source identification and digital synthesis of the far field noise. Then the introduction of new design of physical source arrays to direct the sound at the pedestrian, without unduly increasing the ambient noise level in other directions, and the psychoacoustic design of the sound waveform so that it can be recognised by pedestrians, without unduly increasing the overall sound.

Synopsis of Talk #2: Acoustic Intelligence Monitoring at the Edge (AI-ME) in Urban Environment

With the advent of powerful edge computing device and advancement of light-weight deep learning model, smart sound sensing in urban environment is becoming a reality. Digitisation of urban sound and apply digital techniques to detect acoustic scene of dominating events and their directional of arrival, and other sound information can now be extracted and analysed in real-time. In this respect, a given acoustic scene that comes in violation of the noise code can now be recognised more accurately by this smart edge device, instead of simply using a sound pressure level meter. In addition, a richer descriptive analytic of the urban sound can now be mapped out in a residential area over time, and mitigation measures can also be carried out more effectively. Furthermore, this smart acoustic sensing device also serves as digital ears to complement the digital eyes of the CCTV camera to provide 24/7 remote surveillance for critical facilities and places.

Opening Speaker

Mr. Sze Tiong Tan

Director (Environmental Sustainability Research), HDB

About the Speakers



Professor Steve Elliott

Institute of Sound and Vibration Research
University of Southampton, UK

Steve Elliott graduated with first class joint honours BSc in physics and electronics from the University of London, in 1976, and received the PhD degree from the University of Surrey in 1979 for a dissertation on musical acoustics. He was appointed Lecturer at the Institute of Sound and Vibration Research (ISVR), University of Southampton in 1982, Senior Lecturer in 1988, Professor in 1994, and served as Director of the ISVR from 2005 to 2010. His research interests have been mostly concerned with the connections between the physical world, signal processing and control, mainly in relation the active control of sound using adaptive filters and the active feedback control of vibration.



Professor Woon-Seng Gan

Director of SMART Nation Lab @ School of Electrical and Electronic Engineering
Nanyang Technological University, Singapore

Woon-Seng Gan received his BEng (1st Class Hons) and PhD degrees, both in Electrical and Electronic Engineering from the University of Strathclyde, UK in 1989 and 1993 respectively. He served as the Head of Information Engineering Division, School of Electrical and Electronic Engineering at Nanyang Technological University from 2011-2014. He is currently a Professor of Audio Engineering and Director of the Smart Nation Lab in the School of Electrical and Electronic Engineering in Nanyang Technological University, Singapore. His research in both theoretical and practical implementation of signal processing and deep learning techniques for active noise control, sound event detection, and spatial audio.

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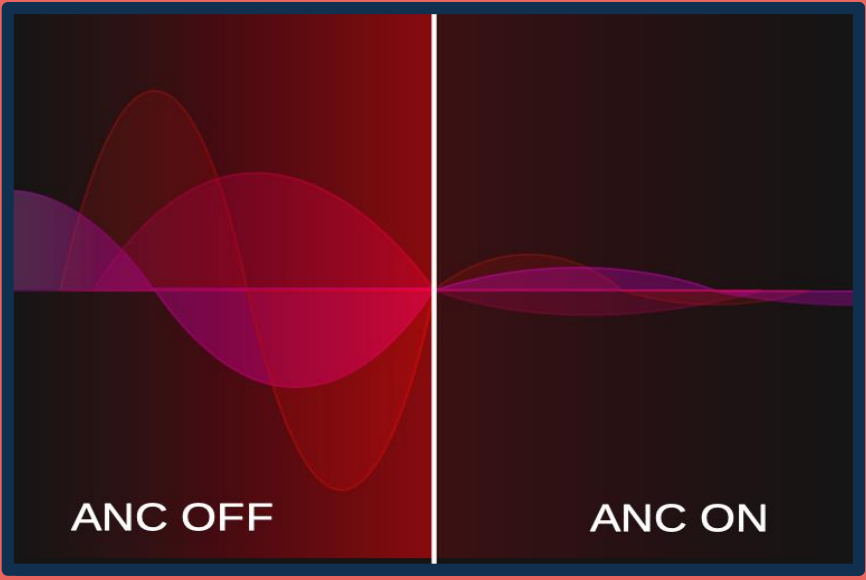


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Urban Noise Webinar Series

Active Noise Control and How to apply to Building and Construction

Date: 18 August 2020, Tuesday

Time: 3pm to 4.30pm

Webinar will be conducted on Zoom

[Register Here](#)



Synopsis of Talk #1: A Trial of Mitigating Floor Impact Noise by ANC technique and other ANC Topics in the Construction Field.

Floor impact noise is one of the important problems bothering our comfortable life. Normally various passive methods reducing floor vibration are applied, such as increasing rigidity or mass of floor, installing vibration insulators or dampers and so on. Some active methods have been also tried to develop but have not been practically used in commercial base. We tried to develop a simple technique mitigating floor impact noise by active noise control in the receiving room. It is a technique to control the reservation time in the receiving room. About 4dB noise reduction in 63Hz octave band region was obtained and the rating of floor impact noise performance was upgraded one rank. In this talk, we will introduce not only the above experiments but also other ANC topics in the construction field, such as noise barriers, construction machines and so on.

Synopsis of Talk #2: Active Noise Control and its Application for Mitigating Noise through Open Window

With the advent of powerful and low-cost embedded processors, analog-to-digital convertors, and acoustic sensors, we are now seeing wide-spread usage of digital active noise control (ANC) technologies in consumer products, like headphones and in automobiles. In this talk, I will showcase our latest work in extending ANC applications to a larger region of control, such as in open windows and openings of noise sources, and also the effective noise cancellation performance of the ANC system. This work has also recently been featured in the Nature Scientific Report. Some of the existing performance limitations and effective range in cancelling out noise sources will also be explained in this talk. Through advanced digital and AI techniques, we are now working towards a more flexibility approach to cancel out selective noise sources and personalized our noise control to better suite human preference.

About the Speakers



Professor Masaharu Nishimura

President N.Lab (Machinery Noise Consulting), Japan

Masaharu Nishimura received his master's degree in engineering from Department of Aeronautical Engineering in Graduate School of Engineering of Kyoto University in 1972 and his Doctor of Engineering from Himeji Institute of Technology in 1990. He worked for Takasago R&D Centre of Mitsubishi Heavy Industries, Ltd. for 30 years until 2002. During this period, he has participated in many kinds of noise control jobs of various machines, e.g. air-conditioners, construction machines, vehicles and power plants. His current research interests are decentralized active control system such as Active Noise Barrier and Active Acoustic Shielding and some passive sound insulating techniques using light membrane.



Professor Woon-Seng Gan

Director of SMART Nation Lab @ School of Electrical and Electronic Engineering

Nanyang Technological University, Singapore

Woon-Seng Gan received his BEng (1st Class Hons) and PhD degrees, both in Electrical and Electronic Engineering from the University of Strathclyde, UK in 1989 and 1993 respectively. He served as the Head of Information Engineering Division, School of Electrical and Electronic Engineering at Nanyang Technological University from 2011-2014. He is currently a Professor of Audio Engineering and Director of the Smart Nation Lab in the School of Electrical and Electronic Engineering in Nanyang Technological University, Singapore. His research in both theoretical and practical implementation of signal processing and deep learning techniques for active noise control, sound event detection, and spatial audio.

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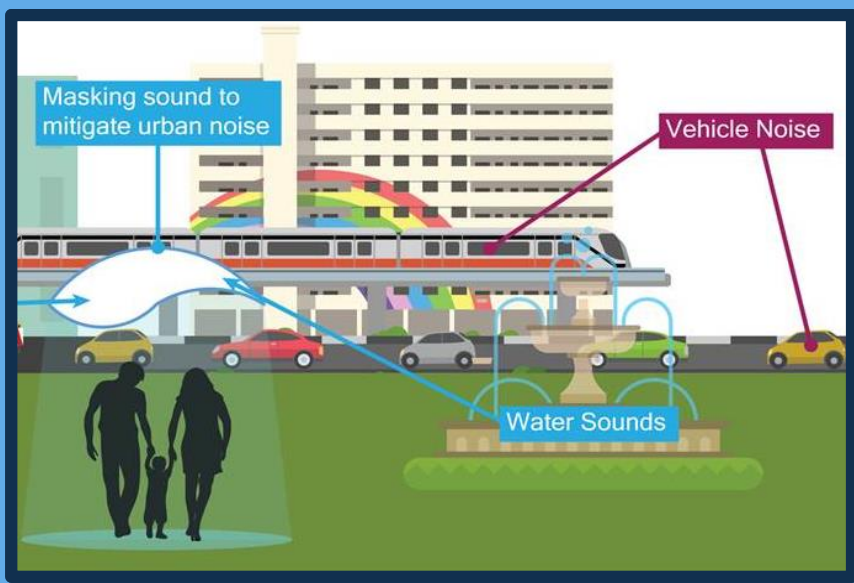


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Urban Noise Webinar Series

Soundscape and the Role of Virtual, Augmented, and Mixed Reality in its Design and Implementation

Date: 19 August 2020, Wednesday

Time: 3pm to 4.30pm

Webinar will be conducted on Zoom

[Register Here](#)



Synopsis of Talk #1: Soundscape Design: Beyond Quietness

Soundscape, the acoustic analogy to landscape, is an emerging paradigm in noise management, which emphasizes on human perceptions. We will first introduce the concept of soundscape and its accompanying ISO standards. In addition, soundscape design approach based on sound masking to reduce perceived loudness of noise and to enhance overall pleasantness of soundscape will be presented. This talk will provide useful insights on perception-driven design solutions for designing sustainable and healthy urban acoustic environment.

Synopsis of Talk #2: Virtual, Augmented and Mixed Reality for Soundscape Evaluation and Design

The heavy emphasis on context in soundscape calls for the development of a suite of evaluation and design tools that are grounded in human auditory perception. The timely resurgence of virtual-, augmented-, and mixed-reality (VR, AR, MR) head mounted devices coupled with spatial audio technologies allows for the creation of an immersive audiovisual experience suitable for the design and implementation of soundscapes. Some examples where these technologies can be applied are shown.

About the Speakers



Asst. Prof. Joo Young Hong

Assistant Professor in Architecture and Sustainable Design,
Singapore University of Technology and Design

Jooyoung received his B.Sc and Ph.D. in Architectural Environmental Engineering from Hanyang University, Seoul, Korea in 2010 and 2015, respectively. In 2017, he was a recipient of the prestigious Lee Kuan Yew Post-Doctoral Fellowship at Nanyang Technological University, Singapore. His umbrella research area of interest is in soundscape. Soundscape, the acoustic analogy to landscape, is a new paradigm by emphasizing a holistic perspective of the perceived acoustic environments in a given context. He has investigated relationships between physical acoustic phenomena and human perception in the indoor and outdoor environment through multidisciplinary approaches from acoustics, psychology, architecture and urban planning.



Dr. Bhan Lam

Research Fellow, Nanyang Technological University

Lam Bhan received his B.Eng. (Hons) and PhD degrees from the School of Electrical & Electronic Engineering (EEE) at Nanyang Technological University (NTU), Singapore, in 2013 and 2019, respectively. He was awarded the NTU Research Scholarship and EEE Graduate Award to undertake his PhD under the supervision of Professor Gan Woon Seng. Besides active noise control, another area of interest includes exploring the complimentary paradigm of noise mitigation using the soundscape approach. Previously, he has developed spatial audio recording and reproduction frameworks for both Virtual and Augmented reality platforms for conducting subjective audiovisual experiments.

Closing Speaker

Professor Woon-Seng Gan

Director of SMART Nation Lab @ School of Electrical and Electronic Engineering
Nanyang Technological University

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