HOT TOPIC 4: ACOUSTIC PRODUCT DESIGN

Optimization of the Product

Organizer: KFB Acoustics

ABSTRACT
The aim of the training is to help the participants to gain knowledge necessary to perform the full process of acoustic optimization of the product. The course combines an experimental and virtual approach and the factors considered include both objective and subjective parameters of product quality assessment. The participants of the course will gain knowledge through both lectures and practical activities, such as measurements and analysis of the particular object. The organizers' goal is to introduce the full flow of the acoustic optimization process in an easy, interesting and understandable way, and to outline new approaches in acoustical design.

TRAINING FLOW
Form: WORKSHOP (lecture, measurements, analysis)
Objects under tests: UV-C disinfection lamp with airflow

DAY 1

1. The process of acoustic product design
2. Introduction to psychoacoustics and sound quality
3. Psychoacoustics in case study

DAY 2

1. Understanding the product - from sound generation to emission
2. Benchmarking and target sound development (PRACTICAL)
3. Performance of acoustic measurements of DUT (PRACTICAL)
4. Analysis of measurements and review of technical solutions
5. Acoustic model - possibilities, calibration and evaluation
6. Acoustic simulation of the product

DAY 3

1. Acoustic measurements of modified product and assessment (PRACTICAL)
2. Summary of results of workshop measurements and analyses
3. Test
4. Summary

ACADEMIC TUTOR

André Fiebig

André Fiebig earned his PhD in the scope of psychoacoustics at the Technical University Berlin. He worked for more than a decade for the HEAD acoustics GmbH, Germany and led a working group concerned with product sound quality projects. Since January 2019 he is a visiting professor in the Department of Engineering Acoustics at the Technical University Berlin teaching psychoacoustics and noise effects. He is active in different working groups related to national and international standardization. His special research interests are noise effects on humans with special emphasis on soundscape, psychoacoustics and product sound.

KEY TRAINERS

Bartosz Chmielewski

Currently working on and supervising projects related to virtual prototyping, development of products noise control, development of analytical methods in SEA and FEM simulations, noise monitoring (IoT and machine learning) and active noise control.
He is also responsible for the design of acoustic laboratories in the Acoustic Research and Innovation Centre and participates in several industrial projects related to fan noise and custom noise control solutions.

Paweł Nieradka

Paweł Nieradka is leading R&D department of KFB Acoustics in the area of computational acoustics. He is currently conducting his Ph.D. thesis “Analysis of vibroacoustic energy flow in complex continuous systems by the Statistical Energy Analysis method” at the University of Science and Technology in Wrocław. With his eight years of experience, he specializes in performing vibroacoustic analyses including both experimental and numerical approaches. He is a member of the Polish Acoustical Society (PTA) and a certified hearing care professional.

Kinga Ziomek

Kinga Ziomek graduated from the University of Science and Technology in Wrocław with a master's degree in acoustics. She is a specialist in KFB Acoustics' R&D department and serves as a leader of the acoustic optimization area. Her six-year professional experience includes numerous projects related to custom industrial noise control solutions, measurement and modelling techniques. Presently responsible for the development of vibroacoustic services and acoustic analysis of products. She is also an initiator of Noise and Vibration section of AES student section in Wrocław.

EQUIPMENT

- Multi-channel, mobile systems for recording and sound analysis with psychoacoustic analyzes (HeadAcoustics) and a listening system
- Multi-channel vibration measurement systems
- Microphone array (GFAI Tech)
- Laser vibrometer (1 axis Polytec)
- and more

ABOUT COMPANY

KFB Acoustics specializes in providing research and consultancy services within the domains of noise management, product development, and environmental noise solutions. The Research and Development team at KFB comprises accomplished professionals who have received numerous accolades in their respective industry. Their focus lies in pioneering inventive solutions.

Since 2016, KFB Acoustics has actively participated as a member of the Acoustics Committee of the Polish Academy of Sciences. Additionally, the company is the proprietor of the online acoustics e-learning platform, Acoucou.org.

The recently inaugurated Acoustic Research and Innovation Centre (ARIC), established in September 2022, serves as a hub for engineers and scientists in the realm of acoustics. Boasting cutting-edge laboratory equipment, along with advanced measurement and analysis techniques, ARIC extends a comprehensive array of services to partners and clients. It is designed to foster and promote collaboration in engineering and education, with a strong emphasis on applied research.

For more information about the company, please visit https://kfb-acoustics.com/

ARIC: *https://kfb-acoustics.com/partner/#aric*