

New sound research to improve health and quality of life

Today, 40 pct. of the Danish population are negatively affected by sound, and every fifth Dane is exposed to sound during the night in quantities that are profound harmful to health. That is why Innovations fund Denmark, Bang & Olufsen, SoundFocus, Wavecare and Aalborg University have partnered up in a new, major research project, to develop an audio system, that improve health and quality of life for Danes – initially in hospitals and at home.

Several studies have shown that unwanted sound have great consequences for humans. It is the cause of stress, heart diseases, psychological problems and lower well-being and productivity. On the other hand, wanted sound e.g. music or nature sounds, have demonstrated positive effects. It can be stress-relieving, pain-relieving, lowering nervousness and give a sense of joy. Therefore, there are major health potentials in delivering positive sound impressions, while reducing unwanted sounds. This will be addressed in a new major research project which the Innovation Fund Denmark supports with almost DKK 20 million.

The objective of the new project is to develop an entirely new type of sound system, where speakers not only play a specific channel, but in interaction are able to create a number of audio zones in a room or area, where you can control the sound being played and mask unwanted sound. Without the use of e.g. headphones or other personal equipment.

The researchers and organisations part of the project will specifically develop a dynamic and interactive sound zone system that adapt to the environment. The system will automatically and with continuous measurements change the acoustic settings based on the user's wishes and needs, and thus make the sound zones able to change the shape, size and location in e.g. a private home or in a hospital.

Nowadays, there is no well-functioning sound zone system that can control wanted and unwanted sound or adapt to changes in acoustic spaces, for example change of number of people in a room or if you open a window. According to Jesper Kjeld Skov, Head of Department and Professor in Computer Science at Aalborg University, the potential health benefits are enormous in the new project. It is estimated that 40% of the population is negatively affected by sound, and 20 % of the population are during nighttime exposed to sound in quantities that are directly harmful to health.

"In general, too little focus has been on the health effect of sound – and not least unwanted sound. But it has a huge impact on the wellbeing and health to all of us, and we also believe that the potential for dynamic sound zones are enormous. Imagine if we in the future you can create an invisible sound bubble around patients in a hospital, where we remove unwanted noise or increase positive sounds. Or, on a plane or at home, you can create a healthy sound environment with significantly less experienced noise. With such a system, we will be able to change the way we are influenced by our physical environment and it will be beneficial to our health," says Jesper Kjeldskov.

The project is a collaboration between the organisations Bang & Olufsen, Soundfocus, Wavecare, and Aalborg University's institutes for Electronic systems and computer science.

Søren Bech, Research Director at Bang & Olufsen says: "In Bang & Olufsen it is one of our focus areas to use our core competencies within sound to improve quality of life for people, by contributing to research and raising awareness of the positive effect sound can have on people's well-being and health. We are very proud to be part of such a large and important project, and we look forward to working with the other partners."

Together, the partners will develop and test an interactive dynamic sound zone system, which initially will be used in hospitals and in private homes. In these locations, sound impression management can have great healing and preventative effects. It can improve patient environment, working environment, family environment etc. In the longer term, it is expected that the results from the project can be expanded and scaled to e.g. outdoor areas and large public spaces.

Additional Information

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Facts

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The Partners

Bang & Olufsen is a global luxury and lifestyle brand founded in 1925 in Struer. The company continues to be among the world's leading in audio innovation, and Bang & Olufsen's products are characterized by the unique combination of great sound, timeless design and outstanding craftsmanship. Bang & Olufsen currently has 900 employees and is represented in more than 70 countries.

Since 2010, SoundFocus ApS has developed and sold systems for personalised and interactive audio communication in the health sector. The systems are based on the use of directional speakers so that the sound output, without using headphones, can be limited to one patient at a time. The systems are particularly used in intensive care units, ambulances and psychiatry.

Wavecare ApS develops and implements sense-based health tech solutions and has documented methods to calming through the use of sound, light and film of nature. Research has shown positive results in several clinical areas, including deduction of acute cesarean and better absorption of medication.

BANG & OLUFSEN

The AAU Research group (Aalborg University) in Signal and Information Processing (SIP) has great expertise in acoustics, signal processing of sound zones, transmission of sound over networks and the human perception of sound. The group also has acoustic laboratories with state-of-the-art audio zone setups.

AAU's Research group in Human-Centered Computing (HCC) has great expertise in interaction design and user experience, development of new interaction techniques, and user studies of interactive technology in real-world environments – at home and within healthcare.

Audio zone illustrations

