ARTISTIC CONTRIBUTIONS TO AMBIENT SOUND DESIGN.

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ABSTRACT.
For several years the Norwegian University of Science and Technology, NTNU, has offered the Master course Interdisciplinary Teamwork ("Experts in Team", EiT). EiT is organized into "villages" consisting of up to thirty students. The Acoustics Group, NTNU, is organizing a village named "Soundscaping", mainly dealing with sound design in public areas. The students of each village are divided into teams of five. The team members may represent very different fields of study like history, music, electronics, physics,, architecture, medicine, computer science and more.

This paper shows aspects of interdisciplinary teamwork training in acoustics and gives examples of very different
and interesting results and sound products ranging from pure sound art installations and interactive educational
software to talking waste basket, wind harp and new developed sound sources.

BACKGROUND.
The design of new Master of Science programs concluded that the teaching of engineers at the Norwegian University of Science and Technology, NTNU, should include

- Fundamental knowledge of natural science
- Social abilities
- Teamwork and coaching
- Motivation of co-workers
- Verbal and written communication
- Creativity
- Solve multifaceted problems
- Adjustment to changes

As a conclusion the students should gain skills that enable them to work together with people from different professional backgrounds and ensure that they can function as a team. Keywords are

- Multidisciplinary understanding
- Teamwork competence
- Interpersonal communication skills
- Creative thinking

This was the background for the idea of developing The Interdisciplinary teamwork "Experts in Team" as a mandatory NTNU Master course. To follow up this intention The Acoustics Group, NTNU, offered the EiT theme "Soundscaping", which could include a widest variety of ideas in sound and acoustics design for outside and indoor implementation. Detailed project descriptions where developed by the students themselves. As soon as a project was accepted after being evaluated on scientific and financial basis, the students started to focus on teamwork and cooperation strategies and the process of developing a product, at least a prototype, for demonstration.

PROJECT EXAMPLES.

Most of the completed projects fell into three categories,

- sound art installations
- interactive entertainment and educational computer programs
- sound products and instruments.

The following projects from the last three years, emphasizing and enhancing ambient sound in open or closed
spaces, are presented as video clips or sound examples at the poster presentation.

“EASY LISTENING”
- an audiovisual art installation, produced by Gustav Trøan Ruø, Kristian Muri Knausgård, Brage Tuflåt and Jørgen Orheim.
Ice balls with in frozen three colored LEDs (red, white and blue) are mounted above metal plates to give a certain sound as the ice is melting. A 10 channel sound distribution system fills the room with music composed solely on the basis of transformed water and dropping sounds. All the electro acoustical control units and amplifiers are constructed and developed by the student group.

“THE SOUND DOOR”
- a sound installation produced by Hilde Sunde Tveit, Stian Borgen Holmås, Stein Olav Nesse, Øyvind Nygaard and Sverre Knut Johansen.
Entering the door takes you to a random chosen sound environment such as the concert hall, the railway station, the kindergarden – with no previous warning.

“RUST”
- a sound art installation by Eirik Mathias Husum, Tommy Dahlen, Ingrid Melbye Michelsen and Invald Desserud.
Bended rusty iron plates are equipped with loudspeaker drivers. The system is fed with new composed music in order to give a specific sound experience in the art room.

“THE CORRIDOR OF HISTORY”
- an interactive sound installation by Arild Apeland, Håkon Berge, Simon Larsen, Ola Natvig and Eirik Tuftin.
The hallway is divided into five separate areas equipped with loudspeaker to make a sound illusion of being in another space and time. A logic control system makes it possible to experience the sound sones only walking in the correct direction. Else it is quiet.

“THE SOLENOPHONE”
- a MIDI controlled music box by Andreas Hoftun, Andreas Landmark, Helge Surdal, Linda Karin Wiik and Håkon Aaltvedt.
Metal tubes and drums are activated by MIDI controlled solenoids. A lot of special arranged popular tunes have already been presented on YouTube.

“THE BOSS”
- an interactive “talking” waste basket produced by Mats Berg, Knut Imar Hagen, Geir Stenvaag, Tron Tronstad and Arne Weiby.
The basket, so far only prepared for paper waste, is equipped with a computer controlled camera under the top hat. As soon as some incoming waste is registered the response is a random chosen sound or spoken sentence. It’s popularity in the kindergarden was enormous. For interested readers here are two more projects, not directly related to room acoustics, but intriguing in the resulting sounding objects. Vide clips and sound recordings will be presented at the poster stand.

“play1sound”
- interactive acoustical music related sound sources produced by Jørund Waagø, Kari Th. Dahl, Mathias G. Lervold, Stine Laukvik and Øyvind H. Vikanes.

“ELEMENTALIS”
- weather activated sound sources produced by Kjetil Gjelstenli, Henning Pedersen, Tore Sandbakk, Erlend Magnus Viggen and Siv Elise Aasebø.