A deaf-blind person is handicapped in many everyday situations. Three different functional areas are severely impaired: Mobility: ability to move and physically orientate oneself in the surroundings Communication: ability to exchange information with persons in the surroundings Monitoring: ability to detect and interpret ongoing activities in the surroundings

A portable aid for monitoring events in the environment can make the deaf-blind world more comprehensible, increase feelings of security and improve control over the surroundings using cutaneous sensory perception. With improved control over the surroundings, the deaf-blind person can plan actions and prepare for approaching persons and vehicles.

A laboratory prototype of a three-microphone digital system for real-time directional analysis of sound sources has been developed. The system is mounted on eyeglasses and codes the sound source direction to two vibrators placed behind the ears.

The present research concentrates on development of different algorithms for analysing sound source identity as well as direction. The algorithms process the sound and fit it to the vibratory sensitivity threshold of the skin. In a series of laboratory studies, 8 different algorithms have processed 45 environmental sounds. Normal hearing and deaf subjects have identified the processed sounds using the hearing and vibratory sense, respectively.

Test results showed that frequency transposition of sounds was necessary and that the best algorithm in auditory tests was not the same as in the vibratory tests. The preliminary results of vibratory sensory tests showed that the best algorithms were modulating algorithms.

The algorithm that best enables identification of environmental sounds will be selected for further laboratory and field studies.

The best algorithm will be loaded into the processor, where the detected sound will be processed and presented to the deaf-blind person via the third vibrator, which will be placed individually. The subject can choose places where the skin has high sensitivity, for example on the hand, arm or another body area.