



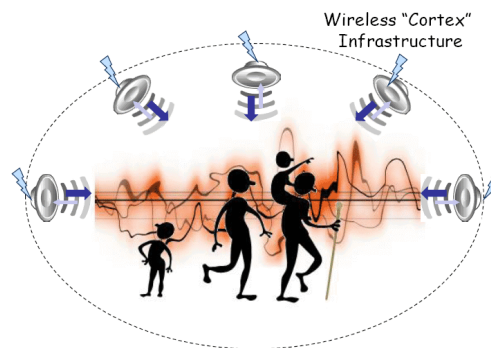
acoustic **SC**ene **AN**alysis for **D**etecting **L**iving **E**ntities

AIMS

Fundamental to natural cognitive systems is the ability to detect and differentiate other living creatures in the world and to characterise their behaviour. Sound is the primary medium for long distance passive and active interaction between animals, and between animals and their environment; ranging from human speech communication to the active acoustic scene analysis of bats and dolphins using bio-sonar.

The project aims to develop what is essentially an acoustic analogy to a camera-based visual scene analysis system; one which is particularly suited to detecting the presence and characterising the behaviour of living entities.

Our ultimate aim is to prototype a real-time distributed system that is capable of forming composite representations of animate entities in the world exclusively through the use of information derived from sounds.



OUTPUTS

The proposed system will use sound in two ways. Firstly, actively, through the emission and processing of sonar signals, the system will be able to detect, identify and classify moving articulated objects in the environment. Secondly, passively, through the categorisation of sounds emitted by the objects themselves, the system will learn to recognise the acoustic communications of living entities and to associate these messages with their detected behaviour.

Successful achievement of our objectives will result in the development of a ground breaking proof-of-concept acoustic scene analysis system capable of robust operation in real-world environments and suitable for deployment in situations where visual information may be unavailable, unobtainable or even undesirable.

By firmly rooting the technological innovations in the latest scientific understanding of cognition in natural systems, we aim at enabling the creation of artificial systems able to communicate and interact with humans in real life situations, as well as in a better understanding of our own cognitive systems.



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There are myriad real-world applications that can benefit from the technological innovations of this project. Examples include –

- systems that can transparently and non-invasively provide situation awareness (warning signals) such as might be useful at busy road crossings
- detecting movement in a smoke-filled room where cameras are useless
- detection of *intentional* human movements aimed at harming individuals or a group
- recognition of normal/abnormal behaviour in a crowd
- combining with cameras to form integrated multi-modal representations of real-world entities

If you would like to find out more about the project or collaborate with us please visit our web site at:
www.scandle.eu

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KEYWORDS

scene analysis systems / cognitive systems / detection systems / detection of living entities / neuromorphic technology