Advanced ultrasonic sonars for navigation of mobile robots

**ES programme:** INCO-COPERNICUS

**The objective of the project**

To develop multichannel ultrasonic sonar based on the binaural approach with following features:

- Simultaneous determination of position of multiple targets;
- Robust operation in the sophisticated and noisy environment;
- Reliable detection of the reflected signals in the wide dynamic range;
- Simulation of sonar performance.

**Operation principle of the developed system**

The system consists of:

- 4 ultrasonic transmitting transducers (E1-E4);
- 5 ultrasonic receivers (R1-R5);
- Electronic units for generation of driving coded signals;
- Amplification of the received signals;
- Parallel signal processors
- Ultrasonic signals are transmitted by two single side-looking transducers (E1,E4) and two front looking electronically steered honeycomb arrays (E2,E3), each of which consists of 3 MURATA 40 kHz transducers;
- The received signals in each receiving channel are converted into a digital form by 8 bits 250 kHz sampling frequency A/D converters;
- The sensor developed enables to detect various objects (walls, 90° corner type reflectors, furniture) and to measure their coordinates on-line up to 5 m.

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