3DLocus (High accuracy 3D positioning with ultrasonic technology)

Keywords
Ultrasonic technology, high accuracy localization, portable positioning devices

3DLocus is a Local Positioning System (LPS) designed and built by the Lopsi group which uses ultrasonic technology for high accuracy positioning of mobile objects in small indoor areas. By measuring the time-of-flight (TOF) of ultrasonic signals propagating from several static beacons to a mobile node, its position can be computed by multilateration techniques, usually with an accuracy of about 1 cm in a volume of a few cubic meters (see figure).

Key features of the 3DLocus system are:

a) Beacon design with emitting/receiving transducers at each node, enabling bi-directional signal transmission
b) Modulation and codification of the acoustic signals, using the similar principles to the GPS system
c) Use of robust positioning algorithms for outlier detections, compensation of the effects of wind, change temperature, etc

3DLocus can be used as a high accuracy positioning sensor in industrial environments, as well as a portable positioning device in outdoor applications.

Reference to key publications:

The system is described in the following publications (downloadable from http://www.car.upm-csic.es/lopsi/static/publications.htm)


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