



Radio frequency technologies from nuclear waste management to walking sticks

SESAMONET is a new, advanced radio frequency system being piloted in Italy and Germany that could represent a revolution in the mobility of the visually impaired to help them find their way in unfamiliar locations.

The technology was first pioneered in the laboratories of the European Commission's in-house science service, the Joint Research Centre (JRC). Scientists successfully adapted radio frequency technologies to store and track spent nuclear fuel elements (waste barrels). This led to the new application where actual locations are tagged, which can be used to give a wealth of information to persons walking past them.



Joint Research Centre (JRC)

– the European Commission's in-house science service

What this means: The essential change is that from now on the visually-impaired can have vastly improved mobility and safety, both indoors and outdoors.

With the new SEcure and SAfe MObility NETwork (SESAMONET) technology, a visually-impaired person is guided along a secure path which might also be unfamiliar to him. There are three main components: a radio frequency identification technology (RFID), a customised walking stick, and a database of locations.

How it works is that RFID chips are placed in the ground and their position registered in a database. When a person equipped with an adapted walking stick and a smartphone or mobile phone walks past, the walking stick will capture the identity of the RFID chip and transmit its identity to the phone. The phone searches for the received location in the database and simultaneously delivers the associated messages/instructions to the visually impaired user. This can be via a headphone or via the phone's loudspeakers.



Background

The JRC filed the SESAMONET patents in 2005 and 2006 and has since conducted extensive field testing. In 2007, first trials were carried out in Laveno Mombello near the JRC's Ispra site in Italy with the help of local visually impaired volunteers. The pathway leads from the railway station to an old ceramic factory, through the ferry station, winding along the lake shore. Further pathways have been installed in Lusevera-Udine, Rome and Cosenza.

In 2011, a licence was granted to the Italian Blind Association. As the project expands in other countries, JRC scientists and companies such as RealTrace, Deimos Engineering, Sitor srl, Castagna Design, Fusel, and Klostermann GmbH are exploring new applications and user-friendly improvements such as GPS integration and automatic identification of obstacles.

Did you know?

According to the World Health Organisation (WHO), about 284 million people are visually impaired worldwide: 39 million are blind and 245 million have low vision. 82% are 50 years of age and older. 90% live in developing countries where cataracts remain the leading cause. Nevertheless, 80% of all visual impairment can be avoided or cured. The 54 countries in Europe have 15.5 million visually impaired, about 1.75% of the population. Despite an expanding global population, numbers are falling due to combined efforts to combat infectious diseases.

SESAMONET is a small step towards “smart and inclusive growth” in Europe. It illustrates how innovation in one field of research can be successfully applied to problems in others. It is a story that began in nuclear research and is now demonstrating great potential to improve the quality of life for those living with visual impairment. It also demonstrates how the public, private, not-for-profit and academic sectors can come together, twin their research and networks and ultimately bring a good idea to market.