A Smart Walker

The developers of the Smart Walker believe that aging is a change in lifestyle not a medical condition. People might lose some of their mobility and vision – but they don't lose their self-image or likes and dislikes. This intelligent walker, named Guido, aids elderly with visual impairment to walk unaided and with confidence. It uses advanced robotics and artificial intelligence to build the functionality of a guide dog into a robust walking frame. In that way it enables people with reduced mobility and vision to take a walk independently and safely, at the same time regaining self-sufficiency and physical fitness.

Guido spots obstacles, openings and downdrops, lets the user know what is ahead and guides them safely to their destination. The intelligent walker is there to help a user make decisions, not to make decisions for him or her. Unless the user is in danger, it is him/her who is in control, not the technology.

Technology used, includes:

- Scanning laser range finder to locate objects by finding the distance between them and the intelligent walker,
- Sonar range finders to provide back-up sensing for laser, giving information on surfaces and locations that the laser does not see,
- Position sensors to monitor the positions of the wheels, keeping track of where the Walker has moved,
- Handlebar sensors to send the user's input to the computer,
- Steering motors to steer the front wheels (to achieve obstacle avoidance) without driving them,
- Motion controller to interface to the motors,
- A central computer to process all the inputs and outputs, and
- Software: for obstacle avoidance, landmark recognition, user interface and sensor interface.

Simple, intuitive controls make it easy to learn its use. The concept is built on what people have, not what they have not. It therefore reflects a positive sprit of independence and confidence.

The idea came in 1994 from Gerard Lacey, then a PhD student in Trinity College Dublin. Development was possible with grants the National Council for the Blind of Ireland (NCBI) and EU funding under the Telematics Applications Programme. Throughout its development, seniors have contributed enormously by working alongside the developers, testing prototypes and giving feedback and suggestions. Prototypes of Guido have undergone eleven different user trials in Ireland, UK and Sweden, with male and female residents of independent living centres. All had mobility and vision impairments of varying degrees. Mean age was 82. Overall, people responded positively to the walker and no difficulties in use or learning were reported by any of the users.

Key learnings from the trials were about the design - positioning of dials, style of handlebars, and voice message construction. The developers also learned about people's attitude to the overall look and feel of assistive technology - many mentioned the need for the device to fit in with their lifestyle and context, and not label them as visually impaired or disabled. Further more intensive user trials are being conducted by the Veterans Affairs Department of the US Government through the Atlanta VA Rehab R&D Center of Excellence on Geriatric Rehabilitation under the leadership of Professor Rory Cooper and Professor Bruce Blasch.
A photograph taken this year at Rehacare in Düsseldorf shows Bacchisio Zolo from Sardinia with the Smart Walker. He is blind and took Guido off the stand to test it. In his opinion, Guido was 'stupendo'.

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