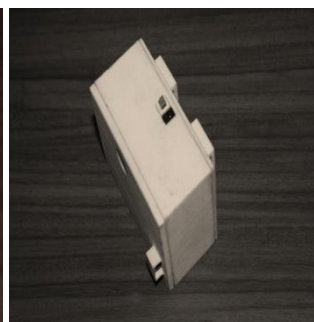


रोशनी

A cellphone based indoor wayfinding system for the visually challenged



Roshni is a portable and self-contained system fabricated using the commercially available infra-red sensor-suite. The system consists of a user module and a network of wall-mounted units spaced at distanced intervals. User module is a waist-worn device comprising of receiver for detecting user movement and a user interface in the form of a mobile phone application. Each wall-mounted unit emits a unique identification tag that is associated with a location on the digital map of the building. The detailed map of the interior of the building can either be downloaded from the net or can be downloaded on the mobile phone at the entry to the building. By pressing keys on his/her mobile unit, the user can obtain directions to any desired location on the map from his/her current position. As the user moves in the building, the waist-worn module updates the position of the user. The navigation information is conveyed to the user acoustically using the text-to-speech engine of the phone application. Roshni has been developed to be applicable and available to users in developing countries. The underlying technology has a pending patent and the device is in final stages of development, user demonstration and feedback.



Need

- Constraints of independent mobility and navigation in an unfamiliar indoor environment is the primary challenge for visually impaired persons
- 87% of visually impaired persons live in the developing countries (WHO, 2009) and hence can't afford expensive technology. Therefore, low cost solution is required.
- Difficulty in navigation especially in GPS denied areas like indoor environment.

Solution

- Roshni is an indoor navigation system based on Infrared (IR) Technology which uses auditory outputs for providing directions to the user.
- The technology involved in Roshni uses mobile application for interaction with user and easily integrates with existing building infrastructure
- Affordable and convenient to use and is targeted for the users in developing countries with little or no access to affordable assistive technology products.

Current Status

- System is installed in an institute building and undergoing user evaluation.
- Efforts underway for permanent deployment in several building for longer term use.
- Based on prior user testing and feedback, improved Roshni waist modules have been developed, prototyped and tested.



भारतीय प्रौद्योगिकी संस्थान दिल्ली
Indian Institute of Technology Delhi

Contact Us:

Prof. M. Balakrishnan
mbala@cse.iitd.ac.in
011 2659 1285

Department of Computer Science
Indian Institute of Technology Delhi
HauzKhas, New Delhi 110016

User Interaction

User study, with consistent help from **Mr. Dipendra Manocha** from **Saksham Trust, New Delhi** and staff and students at **National Association for the Blind(NAB),Delhi** has been an integral part of the development process. Direct user study at every stage including problem identification, design feedback and prototype validation, has led to the development of an improved Roshni waist module with minimized dimension and improved interface design.

About Us

Dhruv Jain, Himanshu Meenia and AshwiniChoudhary are the core inventors of Roshni Indoor Navigation Technology. They have developed Roshni and have been leading the prototyping of the device, while **AkhilaKomarika and Alpna Singh** has been consistently involved in user-testing activities of the project.

Prof. M. Balakrishnan, Prof. P. V. Madhusudhan Rao and Dr. Rohan Paul are mentors and principal investigators at Indian Institute of Technology (IIT) Delhi and are leading the Assistive Technologies Group at the institute. They are guiding and supervising the development process. **Mr. MadanLaVerma** and **Mr. S.D. Sharma** are the Lab Incharge authorities consistently helping the students in developing the User Modules of Roshni. **Supriya Das** and **SatguruRathi** constitute the Current Research Staff of Roshni Team



Recognition

- Emerged as **winners** in **Eureka Paper presentation, Techkriti IIT Kanpur's Technical Festival 2013.**
- Selected as **National Finalist** in **India Innovation Initiative (i3 2013)**
- Received **Best Paper Award** at 13th International Conference on **"Mobility and Transport for Elderly and Disabled People"** (TRANSED 2012).
- Awarded **Best Poster**, in the Poster Presentation at 4th **IBM Collaborative Academia Research Exchange (I-CARE 2012)** held in **Indian Institute of Sciences, Bangalore, India.**
- Received **Media Recognition** in **Deccan Herald, Indian Express, Mathrubhumi Education and Hindustan Times.**

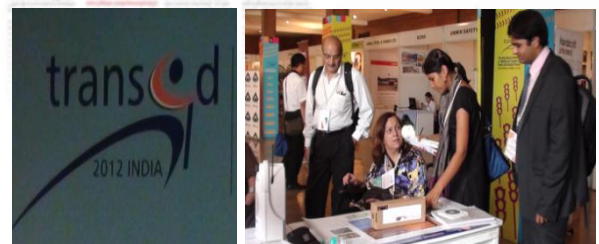
Future Challenges

- Large scale testing with visually impaired individuals under real-life settings.
- Looking for funding partners for further research towards product realization.

Working to beat disability

ANOVATOR
Working to beat disability
Whether it's a person with a physical disability or a person with a mental disability, the goal is to help them live a better life. The team behind Roshni, a navigation system for the visually impaired, is working hard to make that a reality. The system is designed to help people with visual impairments navigate their way through a building. It uses a combination of wall-mounted sensors, a smart phone, and an infra red receiver. The system is currently being tested in a number of buildings in Delhi. The team is also working on making the system more user-friendly and easier to use. They are also looking for funding partners to help them realize their vision of a better world for everyone.

ROSHINI: INDOOR NAVIGATION SYSTEM
Wall mounted sensors, a smart phone and an infra red receiver can make it much easier for the visually impaired to navigate a building.
Students at IIT Delhi have created a navigation system based on the Global Positioning System that can work well if floor plans of building are available.
"The buildings will have infrared-enabled wall-mounted units at a distance of every seven metres. The visually impaired person will wear an infrared receiver on his/her waist and can obtain directions by pressing keys on their smart phone," said Dhruv Jain, co-creator of



For more information visit: www.roshni.info



भारतीय प्रौद्योगिकी संस्थान दिल्ली
Indian Institute of Technology Delhi

Contact Us:

Prof. M. Balakrishnan
mbala@cse.iitd.ac.in
011 2659 1285

Department of Computer Science
Indian Institute of Technology Delhi
HauzKhas, New Delhi 110016