New smartphone app helps blind find their way inside buildings

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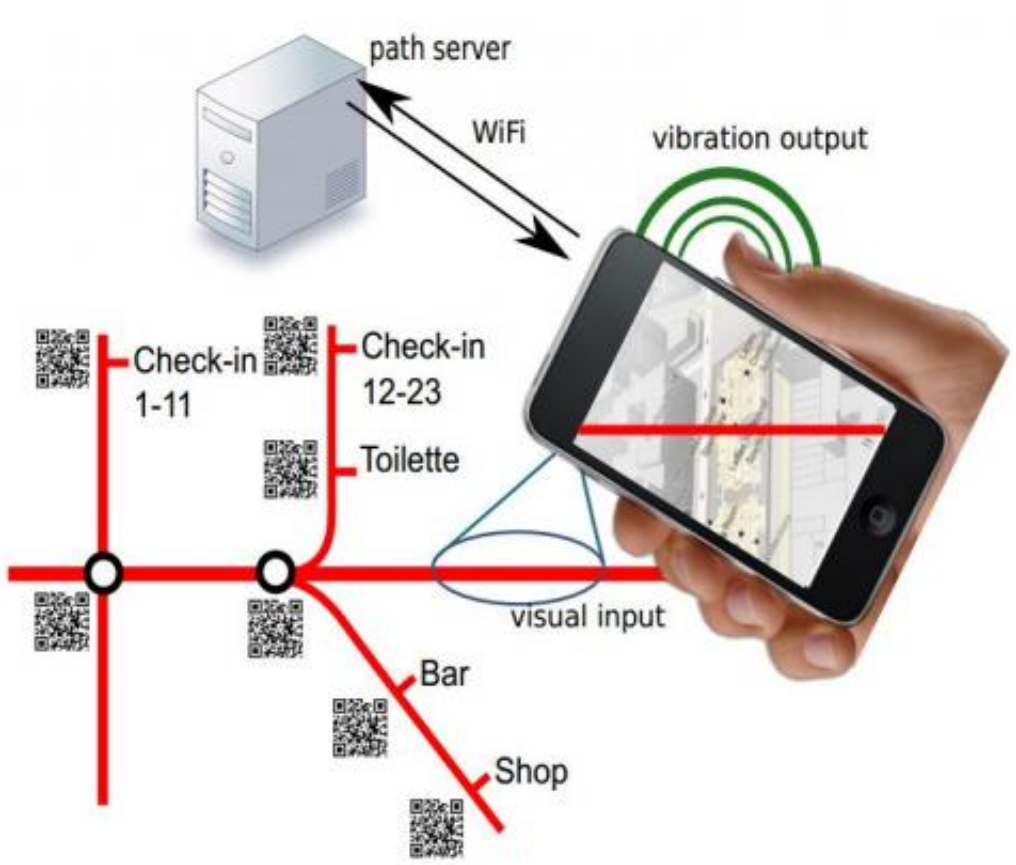

ARIANNA navigation system description. Credit: arXiv:1312.3724 [cs.CV]

(Phys.org) —A new smartphone app developed by a team at the University of Palermo in Italy helps sightless people navigate inside of buildings where GPS doesn't work. The development effort was paid for

by the Andrea Bocelli Foundation and the result is meant as a means of aiding the blind in finding their way around inside of buildings by following a pre-designated path. The app works in conjunction with special tape that is placed on the floor. The user points the smartphone at the floor in a way reminiscent of a cane, swiping it back and forth until it buzzes in their hand, letting them know when to go straight or turn. The team has written a paper describing their app, dubbed ARIANNA, and how it works—it's available on the preprint server *arXiv*.

While it might seem that vision-based smartphones don't offer the blind much utility, researchers around the world have been proving such assumptions unfounded. Smartphones come with cameras that can be used to connect with image recognition software. Also, GPS coordinates can be connected to apps that read maps and send instructions out via the speaker. The problem with calling out directions via the speaker, though, is that sometimes there is other noise in the area that makes it difficult to hear what is being said. To get around that problem, the researchers on this new effort chose to use haptic feedback in a way that is already familiar to many people who use a cane to help them get around. The new app doesn't warn of objects in the path, but instead allows for following a predetermined path that is free of obstacles, ensuring a safe and direct route to a desired destination.

One impediment to the use of such an app is, of course, the lack of sites using the tape to guide users. Some sighted people may regard putting tape on the floor to serve as a guide to be unsightly. To get around that problem, the researchers are looking into adding infrared line recognition—the camera could see the lines, but people could not. While it's not clear if an arrangement could be made to incorporate the necessary floor tape in public spaces (similar to the removal of physical barriers for those in wheelchairs) it seems obvious that the app would be a major advancement for use in locations dedicated to serving the blind.

More information: ARIANNA: pAth Recognition for Indoor Assisted NavigatioN with Augmented perception, arXiv:1312.3724 [cs.CV] arxiv.org/abs/1312.3724

Abstract

ARIANNA stands for pAth Recognition for Indoor Assisted Navigation with Augmented perception. It is a flexible and low cost navigation system for vi- sually impaired people. Arianna permits to navigate colored paths painted or sticked on the floor revealing their directions through vibrational feedback on commercial smartphones.