



SIMO: Australia's indoor mapping project



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For most people, great ideas are triggered by an event or experience that pushes them to do something. For Ramsey-Stewart, it was getting kicked out of art galleries.

"I used to get kicked out of art galleries because I would go up and touch sculptures. I thought 'What if I couldn't see know what it felt like."

But this, he says, is what started his decade-long journey finding a way to help improve the mobility of the blind and Stewart is working with a group of researchers at the University of New South Wales on a project called [Simple Infoc \(http://www.surveying.unsw.edu.au/bviproject/\)](http://www.surveying.unsw.edu.au/bviproject/) (SIMO). Later this year, the team will be releasing their app for enable blind and vision impaired users to receive navigational information on their smartphone or tablet for indoor museums.

"SIMO is all about providing information in a usable format to go from point A to point B fearlessly — if they are blind environment," said Ramsey-Stewart.

The technology being used in SIMO's app is called 'indoor mapping', or sometimes 'indoor GPS'. But while a Global Information to map the outdoors, indoor mapping relies on Wifi access points. When combined with a smart device, location to within a certain range. This is where their app steps in — in places under cover, where satellite signals are not available. Diagnosed with Keratoconus in 1996, a condition that results in blurred vision due to the thinning of the cornea, Ramsey-Stewart's challenge of not being able to confidently find your way indoors.

"The biggest problem with a blind or vision impaired person is that without having that knowledge of where they are that will explore for themselves. What we're trying to do is give them a little mate on their shoulder and that's called Ramsey-Stewart first came up with the idea to explore navigational technologies for the blind and vision impaired during his undergraduate at UNSW. For his graduation project, he created a prototype for a tactile handheld device that was like a cane or a guide dog. This device was also the basis for SIMO's app. He says at the time (2006), technologies associated with GPS were only beginning to become available on mobiles.

When Apple released the iPhone in 2007, he says the game changed.

"Initially it was designed as a stand-alone product in 2006, with sensors built in. With the introduction of the iPhone, it became evident that this platform would be suitable and more financially feasible for us."

Today, GPS and Bluetooth technology is readily available on smartphones and tablets. And the technology has improved. One example is the turn-by-turn navigation feature found on many GPS apps in combination with Apple's screen reader called VoiceOver and combines GPS navigation instructions with audible feedback.

Ramsey-Stewart says indoor mapping is already moving into the mainstream arena, citing Google as a major corporate example. In November 2011, Google launched an indoor maps service as part of its hugely popular Google Maps app, and last year in Australia. Last year, an upgrade to the app saw the addition of [walking directions on Google Maps Indoors](http://mediaaccess.org.au/latest_news/general/google-maps-app-takes-accessibility-indoors) (http://mediaaccess.org.au/latest_news/general/google-maps-app-takes-accessibility-indoors). Apple last month they acquired indoor GPS company WiFi SLAM.

While the technology presents many commercial benefits as shown by Google and Apple, Ramsey-Stewart maintains their app is designed for the needs of the blind and vision impaired people; which is clearly indicated by the simple design of the app. The highlight that it is a piece of technology that will benefit many more people and can be applied to a variety of industries. One of the things the SIMO team want to achieve with their app is to help join the dots about where a specific place is in relation to other points of interest. For example, if a user knows where the building entrance is, they can retrieve information using the app about the location of other points of interest in relation to it. "What I discovered was not everyone is 100 per cent totally blind, only two-three per cent are. And the rest have some degree of vision as well as visual memory," Ramsey-Stewart explains.

He says the app will help to build up a picture of where things are by providing the location of specific points of interest such as building entrances and fire exits. The challenge is how to present directions to a person who is blind or vision impaired — particularly in complex environments where the paths and exits are vast and varied.

To solve this, the SIMO team came up with a simple interface.

"We have built into SIMO the use of a setting system that takes into account such things as colour contrast, the person's height and speed that they walk. This is because every person is an individual and we want to tailor the app to suit them. The app's interface consists of a large arrow that points to the direction of the specified point of interest and the estimated distance to reach the destination. Unlike GPS apps that provide distance estimates in metres and kilometres, the app estimates distance in paces. Paces are based on the person's height. The app also vibrates to indicate an upcoming turn. If the screen is not visible, the information can also be sent to the user through speech output.

Another challenge the SIMO team identified was getting floor plans for buildings. Floor plans are a vital component for accessibility and on council and building owners and businesses to provide the floor plans of public places. In some instances, not all buildings have floor plans available.

building will be available. But the team hopes this is something that can be improved through time. One way they hope to improve is 'explore mode', a feature on the app that uses crowd sourcing to gain information about rooms inside a building.

Ramsey-Stewart explains that the 'explore mode' will allow users to record their own notes about a specific point of interest that is not available. Their notes can then be uploaded to the service and shared with other users to build a database of crowd-sourced information.

Having tested the app with the blind and vision impaired community through organisations such as Vision Australia and the Royal National Institute of Blind People, they have received positive feedback for their app and continue to receive support from the community.

Ramsey-Stewart is the first to admit the road to the development of the app hasn't been easy, but the team remain optimistic.

"It's fair to admit we have had setbacks with key researchers leaving the university but we have overcome those challenges. The team is the best in Australia, if not the world."

The SIMO app is due for release in July 2013.

This article is adapted from [Feature: SIMO — Australia's indoor mapping project \(http://www.mediaaccess.org.au/simo-%E2%80%93-australia%E2%80%99s-indoor-mapping-project\)](http://www.mediaaccess.org.au/simo-%E2%80%93-australia%E2%80%99s-indoor-mapping-project), published on [Media Access Australia \(http://www.mediaaccess.org.au/\)](http://www.mediaaccess.org.au/). Access iQ™ is an initiative of [Media Access Australia \(http://www.mediaaccess.org.au/\)](http://www.mediaaccess.org.au/) independent not-for-profit organisation who advocates for equal access to media and technology for users of all abilities.

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