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Google has launched indoor maps in Australia allowing users to find their way around inside airports, shopping centres, train stations and other large buildings using their mobile devices.

Australian engineers at firms such as Navisens, CSIRO and UNSW are leading the world in developing advanced indoor navigation technology capable of helping people locate specific products on supermarket shelves, tracking athletes' performance or guiding the visually impaired.

The indoor Google Maps technology, which uses nearby wi-fi networks and mobile towers rather than GPS to determine your location, is available for 200 indoor locations across the country.

The indoor maps automatically appear when you zoom in on a building using the app. At launch the most popular venues are shopping centres with many Westfield, Stockland and Centro floor plans covered, among others.

The list also includes 10 train stations (such as Flinders Street and Town Hall), airports (Sydney, Melbourne and Adelaide), several IKEA stores, sports venues (Hisense Arena, Rod Laver Arena, Etihad Stadium, ANZ Stadium) and several cultural venues including the National Gallery of Australia, the Art Gallery of NSW and the Sydney Opera House.

Australian Google Maps product manager Nabil Naghdy said the plan was to rapidly increase the number of floor plans, and to speed this up business owners could upload their own plans to Google.

"It's like having an indoor directory in the palm of your hand helping you work out where you are, what floor you're on and how to get to where you want to be," he said.

Currently only a "handful" of venues support the "blue dot" that approximates your location on the indoor map. Google must do surveys of each venue to determine users can be located to within a few metres.

The technology largely relies on nearby wi-fi networks as conventional satellite technology doesn't work inside or in some built-up outdoor environments. It will initially only be available on Android devices.

Around the world so far about 10,000 floor plans have been added to Google Maps in countries including the US, Britain, Switzerland, Sweden, Singapore, Spain, Japan, Germany, France, Denmark, Canada and Belgium.

Australian indoor navigation firm Navisens recently won the "best technology" award at the Launch Festival 2013 in the US for discovering how to do indoor and underground mapping without any infrastructure, including wi-fi networks.

Navisens managing director Ashod Donikian said his technology instead used the inertial sensors built into smartphones such as accelerometers and gyroscopes to calculate the user's location by measuring their acceleration and orientation from a starting point. This data is then crunched by complex algorithms.

Donikian said there are a variety of applications such as offering targeted location-based deals in shopping centres, finding where specific items are located inside stores, finding seats at sporting events, meeting friends at busy venues and locating people during emergencies.

"In the near future, you will never have to open a door or switch a light, the environment will know where you are and where you're going and act accordingly," said Donikian.

"The heating will optimise to where you spend most of your time. Lights will already be on before you get to the dark room. Your fridge door will slide open as walk to the fridge."

He hopes companies like Google will acquire or license the Navisens technology and incorporate it into their apps to enable more efficient and accurate indoor navigation.

CSIRO has also developed indoor navigation technology and is targeting industries that require extremely high accuracy such as sports and mining. CSIRO's research director for wireless and networking technologies, Dr Iain Collings, said it was accurate to 10 to 20 centimetres.

Catapult Sports is already using the CSIRO technology to track and measure performance data of athletes including six NBA teams and several indoor Olympic athletes.

"Location based services are part of the next revolution of smartphone and tablet applications," said Dr Collings.

Google software engineer Waleed Kadous, an Australian who leads Google's indoor mapping effort from California, told a conference at UNSW in November last year that indoor mapping was approaching the tipping point of mainstream adoption but there were still "major flaws" such as problems gathering the required data.

Kadous showed off an example of an application that is still in development at Google, which allows people to see where their friends are in a shopping centre and easily meet them without communicating

UNSW researchers are working on indoor maps applications for the visually impaired, allowing them to more easily get around chaotic settings such as airports without assistance. They have already developed the technology including a user interface that supports Braille and will begin trials with six visually impaired volunteers this week. The researchers have mapped buildings at UNSW and the Vision Australia headquarters in Sydney to use as test beds.

Another Australian organisation, Abuzz, which already provides interactive wayfinding kiosks in 50 of Australia's largest shopping centres, has been offering to develop indoor navigation apps for existing clients but said the take up so far by shopping centres was slower than expected.