Smart city apps to alleviate Melbourne's infrastructure problems

A rundown of some of the projects at NICTA's infrastructure hackathon in Melbourne

Techworld Australia – Rebecca Merrett - 1 September 2014

More than 100 developers got together during a hackathon last week in Melbourne to tackle some of the biggest infrastructure-related problems such as traffic congestion, safety issues and pollution.

InfraHack, which took place 28-29th August, was run by NICTA and looked at how technology and apps could help make Melbourne a smart city when it comes to its use of infrastructure.

Here are some of *Techworld Australia*'s top picks from the event.

Betterway

There's no shortcut if most drivers on the road are using the same route and creating bumper-to-bumper traffic. So what if the long way around might end up saving you time?

Lida Rashidi, Sarah Erfani (PhD students from the University of Melbourne's Department of Computing and Information Systems), Mahsa Baktashmotlagh (PhD graduate from the University of Queensland) and Michael Coburn (freelance research and business development) built a 'road load balancing' tool to predict congestion on any road

in the city. The tool readjusts traffic lights in real-time so that people are not left stuck in traffic for long periods of time.

The team used a combination of 'deep learning' (fast machine learning), predictive modelling and a graph-theoretic approach, integrating data from vehicle counters and traffic light detectors to optimise the traffic and spread the vehicles more evenly across the roads so that people get to their destination faster. Datasets from VicRoads and TomTom were used.

The team won first prize - two tickets to Silicon Valley and one month to further develop their idea at Melbourne startup hub, York Butter Factory. The team will also get assistance from Code for Australia to further develop the proof of concept.

LO-ZO

Hospitality is the main activity that occurs inside Melbourne's CBD, meaning more traffic added to the city's roads as vehicles deliver produce and goods to restaurants, bars, shops and hotels. More than 3,800 delivery vehicles drive in and out of Melbourne's CBD every day, with last mile freight costing the city $3 billion a year.

Daniel Jitnah, Aditya Dhar, Ali Alen, Tan Yu An and Michelle Bourke developed a 'loading zone finder' that alerts drivers to available loading zone bays as they approach the area of their destination. The finder also indicates when a bay is most likely to be available so they can better plan ahead.

The team used routing algorithms, PHP and Javascript to develop the tool. Data from parking events from bays with sensors and Here.com API were also used.

The team won second prize – one month to further develop their idea at York Butter Factory, one year of free events at StartupGrind and tickets to Pause Festival.

Tram Jam

Injuries from Melbourne's trams - one of the largest tram networks in the world - is a big problem for the city. Transport Safety Victoria reported 30 serious injuries including three deaths in 2013, doubling the amount in 2012.

John Lyons created an app to warn pedestrians and motorists when a tram is approaching them. The app alerts users by flashing a warning signal on their phone screen, as well as makes noise.

Lyons also created a heat map of tram accidents in the city, which displays their level of severity to help people be more aware of dangerous stops. When users create a journey, it warns them when they are approaching a dangerous stop.

Crash Statistics from data.vic.gov.au were used, along with Public Transport Victoria API and Bluedot SDK. The mobile app was created with Xcode in Objective-C, with the backend web service in PHP and MySQL.

SeePark

Anyone who has driven in a city would know how much of a struggle it can be to find parking. To help ease the pain, developers Guan Gui, Zeyu Ye, Herve, Balendran, Chris, Arun created an app that recommends drivers the best car park spot based on their current location and time.

It also automatically sets a timer - based on how long a driver can park for in a certain location - when the user walks out of his/her car park lot to remind him/her when their parking time runs out.

Using geofencing, users can make automatic payments for parking as they enter a parking zone. The app can also help users find their way back to their car.

"We envisioned that by using our app, people could park their cars as easily as just pushing one button 'find parking'. Our SeePark app will then query the server side for best car park lot candidate providing the user's current time and location. We have a smart algorithm running on our server side to predict the availability of every car park lot in CBD using a fusion of Parking Sensor Data and user's mobile sensor data," Gui told *Techworld Australia*.

"The more people using our app, the more accurate our predictions will be. Because we make use of user's mobile phone sensors as well, we can predict those car park lots that do not have park sensors installed, too. Potentially, this can improve Vic gov's parking sensor data, too."

The team used parking sensor data from data.melbourne.vic.gov.au to develop the app. Objective-C, Bluedot SDK was used to implement the iOS interface, with MongoDB and Scala used to store and analyse the dataset.

Petrol Watch

Finding cheap petrol is not always cheap when you're driving around comparing prices. Developer Hans Ha built an app that crowdsources fuel data to help motorist find the cheapest price more easily.

It pulls together real time price details on all of Melbourne's petrol service stations. Drivers enter a price range and the type of petrol they need, and it displays the closest price options.

Once the user has swiped through to find the best option, they just swipe the other way to get the location of the petrol station.

Ha had to use data from fuelwatch.wa.gov.au, but the app can be applied in Melbourne. Open source JavaScript library leafletjs.com was also used to develop the app.