

Project A

Software Engineer: Vivan wu

Client Representative: Hyeokjin Kwon

The Client has an idea for a system that they want to offer to the Sydney Metro Trains provider (who also look after the Metro Train Stations).

Some details about the trains: <https://www.sydneymetro.info/metro-trains>

Some details about the stations: <https://www.sydneymetro.info/stations>

The problem as they see it

Train stations on the Sydney Metro line are a relatively new type of train station in Sydney. The trains that run through these stations do not have a train driver or train guard on board, and the stations run with a different mix of service staff. With this, comes an interesting issue around dealing with the health and safety of passengers and any slip hazards that can occur from liquid spills (e.g. coffee, or other drinks) and also from rainfall on the above-ground platforms. This is especially concerning where these hazards occur near or in front of doors where passengers enter and exit from the trains on the platforms.

How can we use the current surveillance systems (security cameras, ...), to detect any spills or potential slip hazards and notify the station staff promptly that there may be something to investigate / clean up before the next metro train arrives?

The idea

The client has expertise in working with security systems that include the monitoring and detection of changes in environment (e.g. surfaces) and expertise with real-time advertising displays and communications with the Metro notification network. The client believes that they have substantial experience that could be relevant to the problem.

The client believes that the Metro Trains provider will, if presented with a suitably well-planned system, choose to outsource the development of the system that would monitor the security (and other) feeds and send a notification to station staff using the current notification infrastructure. Station staff may be in the "main office", "central command", or be mobile staff who are on the station platform.

These notifications could also suggest if a platform door for a Metro Train service should be disabled for a particular station while the hazard is addressed. This would also include a notification for any incoming Metro services that a particular door will not open at the next station (and passengers should use another door). There may also need to be extra computer displays placed on station doors to alert patrons to the status of a door (e.g. disabled, please move to another door).

There are, of course, many contingency scenarios to plan for, but the main idea is to somehow integrate the existing camera infrastructure with a way to notify various station staff of potential spills / hazards that could be detected near the platform doors and to disable any station doors if required while the hazard is remedied.

The client is well aware of the difficulties and various scenarios that could be considered... and will be rather grateful for well thought-out proposed solutions to those difficulties whether they are simple and cheap or more complicated but more accurate.

Project B

Software Engineer: Hyeokjin Kwon

Client Representative: Vivan wu

The client has an idea for a system they intend to offer to the Macquarie university as an initial pilot project.

Some details about outlets on campus: <https://students.mq.edu.au/uni-life/campus/cafes-bars-restaurants>

Some details about various campus maps: <https://students.mq.edu.au/uni-life/campus/locations/maps>

The problem as they see it

With an eventually plan to return to on-campus teaching, there will be many people who will be going to campus for the first time. It may be hard for people to work out where their scheduled classes or meetings are, where services are available and if they have time to go to a particular food or service outlet on campus before their next scheduled appointment (e.g. a class, or a meeting).

Is there a way we can integrate a person's calendar, class schedule, and the service and food outlet indicators for "how busy are they at the moment?" into an application that can be used for a campus map navigation experience on people's phones?

The idea

The client has expertise in working with security systems that include the tracking and detection of people and interactions in crowded spaces. They also have experience with working on augmented reality systems through recent smart phone advances. The client believes that they have substantial experience that could be relevant to the problem.

The client believes that the University will, if presented with a suitably well-planned system, choose to outsource the development of the system ("How Busy Are They" system) that would monitor the security camera feeds around the food and retail outlets to track average waiting times of people and provide that as a service to another outsourced system for a "Macquarie University Campus Navigation System" that will have a companion phone application which can be downloaded by students, staff, and visitors to campus.

Imagine the following situation: you are a student / staff member on campus who has already downloaded the Macquarie University Navigation Application to their smartphone and linked it to your OneID, and calendar. You open the app to see when your next scheduled appointment (e.g. meeting, or scheduled class) is and want to check how busy your preferred food outlet is. Your phone also has GPS, and so can work out walking times to your next meeting / class location and also any detours and waiting time at your food outlet (based on "how busy" they currently are – whatever that means).

The client is interested in an appropriate mix for features of the systems and what communication needs between the proposed systems: the "How busy are they" system, the "Navigation System", and the companion phone application.

The client is well aware of the difficulties and various scenarios that could be considered... and will be rather grateful for well thought-out proposed solutions to those difficulties whether they are simple and cheap or more complicated but more accurate.