

A total solution applying geo-fencing technology and AI analytics to quarantine monitoring

Compathnion, a SagaDigits subsidiary



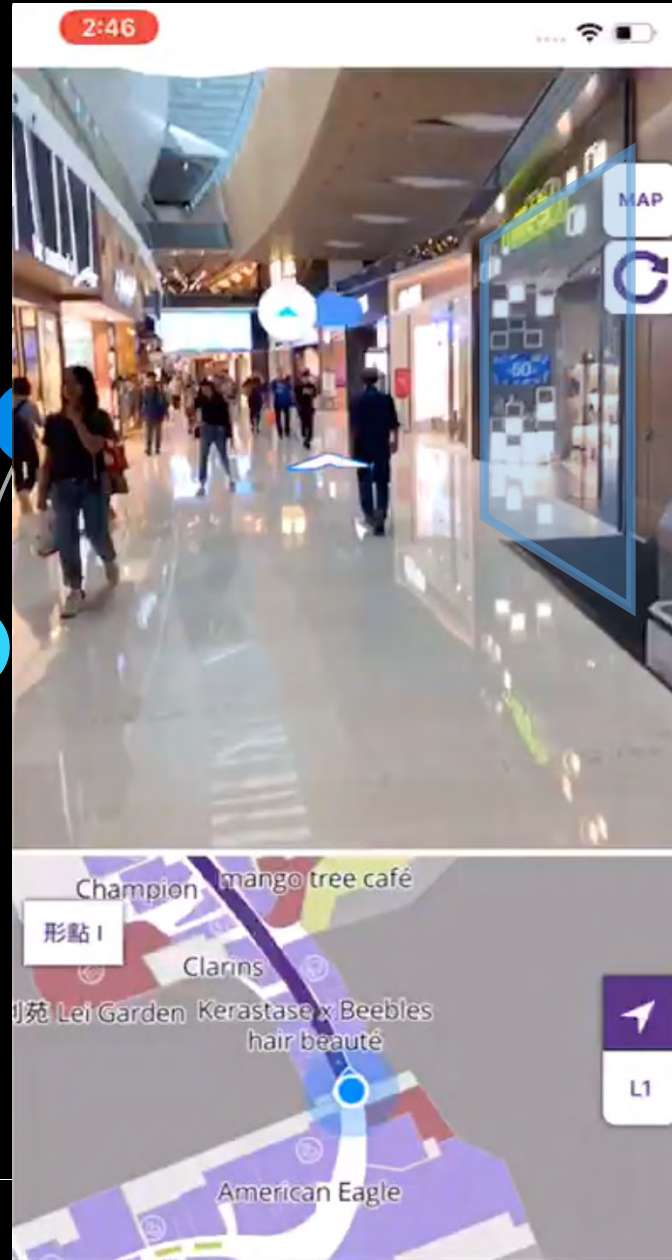
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Smart Retail - Location Based UX

Orientation improvement
(Proprietary Technology)
Orientation algorithm based on compass,
walking direction and camera movement

Customized notification message
Dynamic changes of AR pop up message with
personalized content

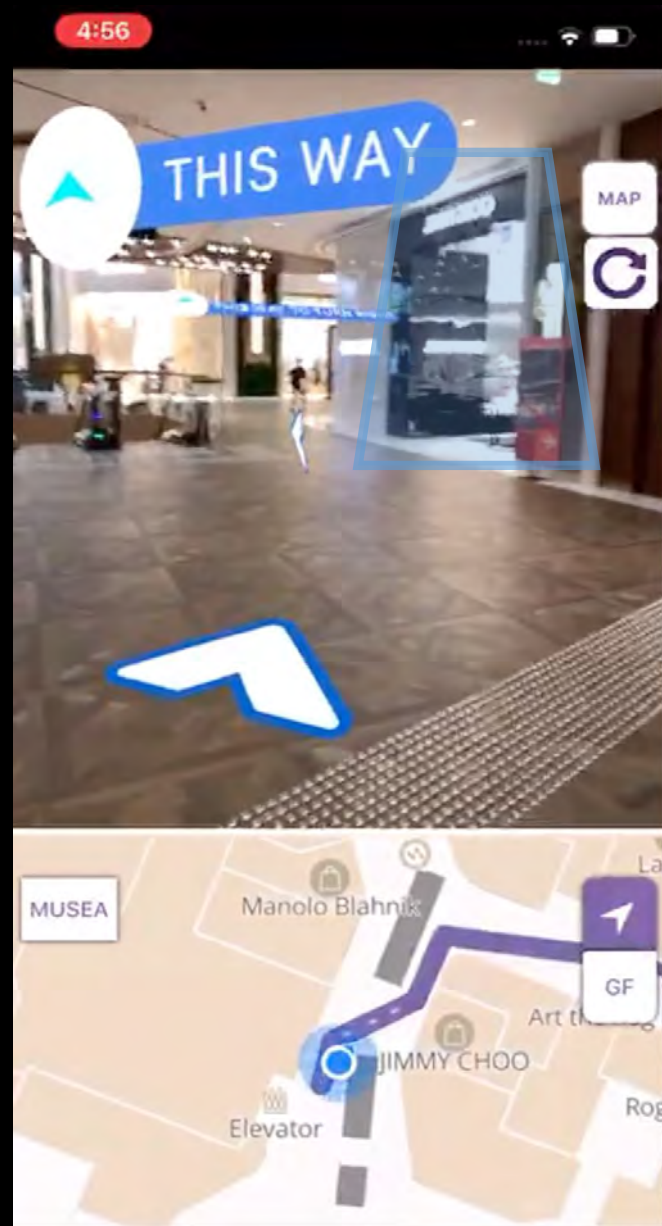
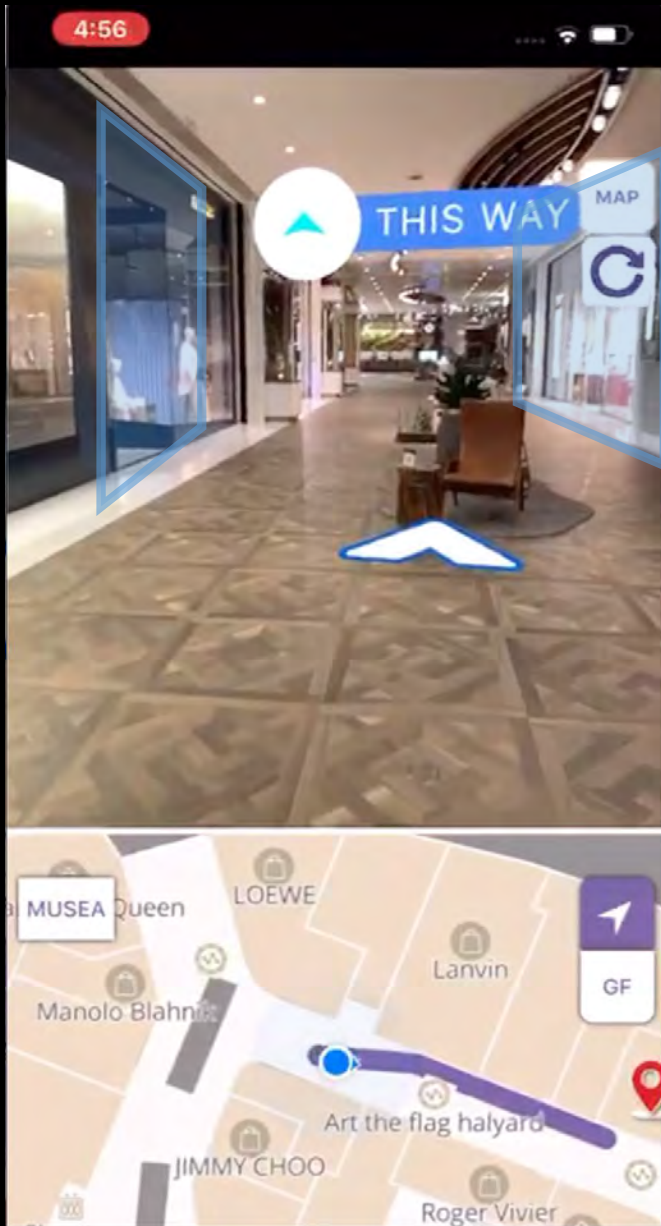
Data Collection
Able to collect Data Set from any Data Source



Netflix like metrics recommendation
Content tailored on consumer behaviours in the
venue

Data integrated content
Content based on integrated CRM, and user
behaviour data

Agile set up AR pathing
AR navigations based on existing ANY WiFi
solutions without image recognition



Pain Points

- GPS alone is very hard (if not impossible) to ascertain high accuracy in a city context
- Privacy: need to make sure exact positioning is not reversible or traceable
- Operations: Quarantine tech is a newly harnessed technology which touches on all walks of life, therefore needs to have a good implementation
- Preparation: how much resources? Hardware? How operators are to be trained?

Workflow

- **Registration/Installation at the airport**
 - (Either self-help or staff assisted during the procedure)
- **User activates the APP**
 - One-click Installation at home
- **During the quarantine period**
 - Location/Signal Scores submit to the cloud
- **End of the quarantine APP**
 - Opt out by the User

The Workflow

1. Registration at immigration

- Register at the immigration / quarantine center
- Time based or generated PIN to protect the registration
- Hardware pairing/profiling at the immigration



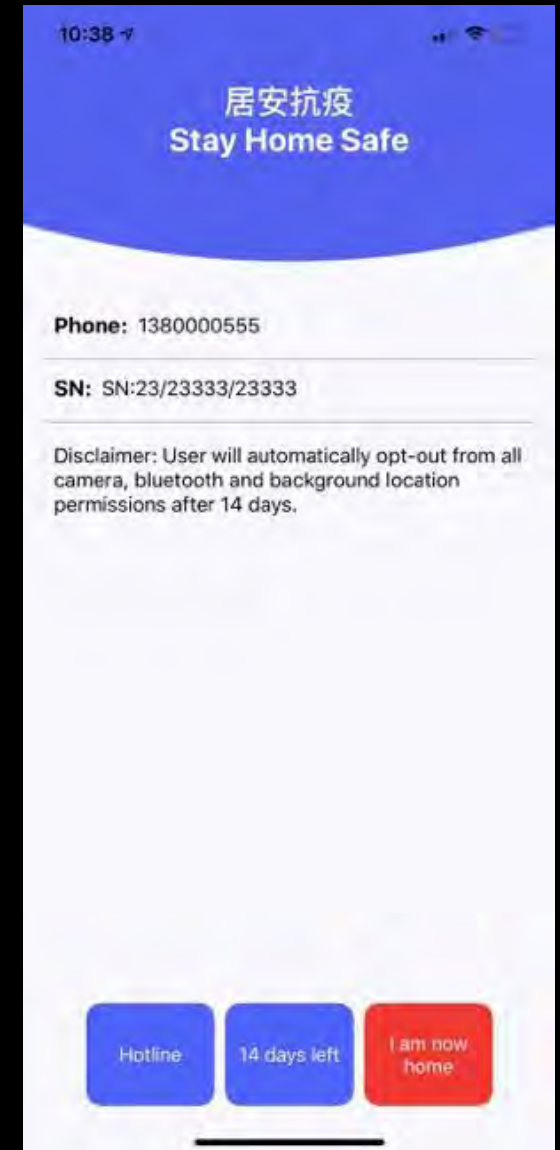
2. Arriving Quarantine Location

- One click to start location and validation signals (e.g. BLE)
- The whole process is around 1-2min with one click



3. Default Home Page

- Basic information for home visit support



Alert Scenarios

- When a user leaves the quarantine location
- A default validation screen will pop up
- The results will be submitted

Paired
device
detection

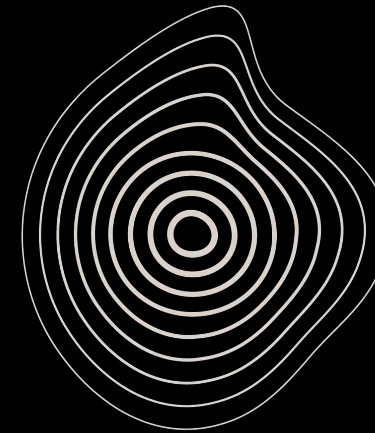


Two Key Indicators

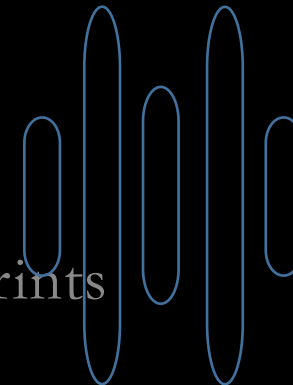
Q1 - If the device is with the authenticated person

Q2 - Whether this person is in the quarantine location.

Signal Fingerprints + Proximity Fencing / Voice Fingerprints



Geo Fingerprint



Proximity Fencing / Voice Fingerprint

Backend Demo

User Scores will be uploaded from APP or from the Speech Recognition and other validators

7 User Scores sorted by [updated at \(descending\)](#) ▼

Search

Showing 7 User Scores

ID	User	Score_type	Score	Color_code	Updated At
5e4c8ed77847df78...	equar1	Scan	0.2	#ee8434	February 19th 2020, 9:26...
5e4c28dd7fcca02d...	equar1	Scan	0.823	#496ddb	February 19th 2020, 2:11...
5e4bd4e2c403a058...	equar1	Server	0.82	#496ddb	
5e4bd4b7c403a058...	equar1	Speech	0.64	#496ddb	
5e4bd43cf3080457...	equar1	Local	0.52	#ae8799	
5e4b2832f3d15e29...	equar1	Local	0.52	#ae8799	
5e4b2774efcbd828...	equar1	Local	0.01	#df4140	



Manager SD



Overview

Management

Expiring

Date:

2020-04-13 - 2020-04-13

Expiring
Expiring
2

Family
3

Quarantine order to be expired (2020-04-02 to 2020-04-05)

> More...

NoRegistration

Tel	Family	End	Scores Count
338000000147	2	2020-04-03	
91751068	1	2020-04-03	

Privacy & Anonymity

- APP side has no personal data information
 - Login id can be generated or the personal ID first digits
- Address can be stored as human non-readable format (LatLng instead of full address)
- Tracking and data will be destroyed with government approval
- Data stored in Government approved site
- Data stored within a local jurisdiction
- Scenario to Avoid: South Korea uses personal data such as credit card records, individual path history, etc. to track confirmed Covid-19 patients and was considered to be a serious violation of privacy

Security and Data Protection

- All data is transmitted via a secured channel (TLS 1.2)
- Provide JWT only for QRCode generation and backend map management communications.
- Use standard authentication OAuth 2 instead of Basic Auth.
- Limit requests (Throttling) to avoid DDoS / Bruteforce attacks.
- Use HTTPS on server side to avoid MITM (Man In The Middle Attack). Server is implemented with the SSL Certs.
- Use HSTS header with SSL to avoid SSL Strip attack.
- Use state parameter with a random hash to prevent CSRF on OAuth authentication process.
- Tested with SSL Test with a status GOOD. (RSA 2048 bits (SHA256withRSA))
- Attackers are avoided by different means of protection. It has been verified by the penetration test to avoid the Vulnerabilities such as: Malicious File Upload, No Account Lockout, No Password complexity and Use of Bootstrap library with Known Vulnerability.
- Used SonarQube to verify the code. It is an open-source platform developed by SonarSource for continuous inspection of code quality to perform automatic reviews with static analysis of code to detect bugs, code smells, and security vulnerabilities on 20+ programming languages. SonarQube offers reports on duplicated code, coding standards, unit tests, code coverage, code complexity, comments, bugs, and security

Development & Deployment – Timeline & Milestones

- UX and features confirmation
- Features Update
- Deployment to servers
 - Installation in dedicated servers
 - Using dockers
- Deployment to APP stores
 - iOS takes longer; assuming it is using Apple account
 - We are Apple's 10 global indoor positioning content management service; we will consult Apple team on it
- Discussion on schedule

Who we are

- Solution already deployed with scale of tens and thousands in Hong Kong
- Deployed at multiple border control points
- Close collaboration with multiple Government departments: Health, Immigration, IT, Port Authority
- Privacy protected solution
 - Store only the distance from home
 - Opt-out solution already reviewed by Apple Inc.
- Indoor Positioning Experts
 - Indoor Positioning and Navigation Experience in Shopping Malls, Hospitals, Public Venue, Construction Sites, and Homes
 - One of Apple Inc.'s 10 indoor positioning service provider Worldwide

Teams



Arthur CHAN (CEO & Director) is serial entrepreneur and a passionate believer of data technology and an enthusiastic advocate of commercial application development. Graduated with a First Class Honors in Bachelor of Engineering, Computer Science from Hong Kong University of Science and Technology (HKUST), Arthur was an exchange scholar at the University of California, Los Angeles (UCLA) and later obtained a Graduate Diploma in English & HK Law (CPE). For more than 10 years, he has been working closely with top global companies in Hong Kong and China in mobile commerce, e-commerce and big data area.

- With ~20 developers already involved in the projects
- Supported by the HKUST Research Center (20-40 people)
- Endorsed by HKSAR Government