Human Mutiny

CROWDING ALERT MAP

By






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Summary

Our project is based on creating an application that informs people about those areas with high vulnerability of contagion, this through the GPS of mobile devices creating a map that indicates the most crowded places, The implementation will allow individuals to register to provide information necessary to assess their current state of health and the application will provide alerts to persons with a high probability of being affected. This application would also show the level of CO2 contamination of a specific area through satellite imagery.

Describe how your project addresses this challenge

Our project would be one of the most conclusive tools in the manipulation of the most up-to-date data of the inhabitants of a population, committing to reflect precise behaviours and thus allow direct prevention towards the individuals of the population and the government departments in making decisions for each country.

Interaction of alerts between the application and the user, to avoid crowds.

What inspired your team to choose this challenge?

Choosing this theme was inspired by the fact that we observe that not all people follow the discipline established by their country, lack of education, social class, which are factors that have made the country we were born in, Panama, increase in cases every day more.

What was your approach to develop this project?

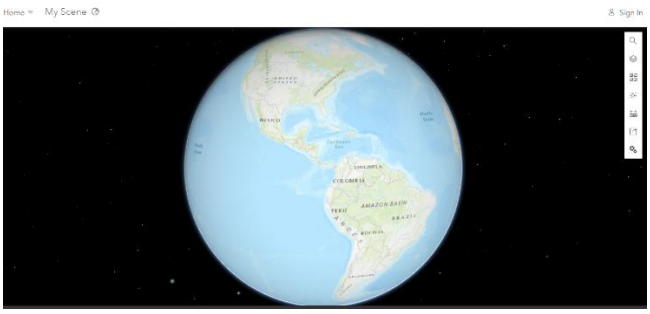
The approach to carry out this project is that we want to achieve better control, so that people who are vulnerable to diseases can prevent the spread of covid-19.

What tools, coding languages, hardware and software did you use to develop your project?

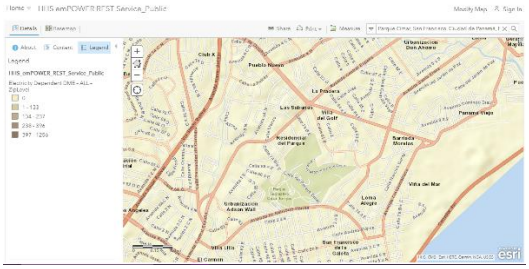
In this project we use the following tools:

GeoHEALTH: for what comes to be the location of the agglomeration of people in certain places.

Gravit Designer for prototype our application of crowing alert map.



choose a place to work for example



Omar park Panama City

Application Process Description

Our Human Mutiny team proposes Overcrowding Alert Map is a mobile application that alerts the agglomeration group. Overcrowding Alert Map uses an artificial intelligence algorithm based on ant behaviour and pheromone trail. It shows a map where groups of pheromone levels are recorded and a classification of pheromones is carried out in order to determine a possible agglomeration, record behaviours of the populations, record places with recurrence of agglomerations and thus predict future agglomerations. To predict agglomerations with low, medium, or high-risk levels, the age of everyone, the distance between pheromones, the distance between individuals, the life span of pheromones, and the pheromone persistence time of the same grade.

Collection of information between individuals in the population

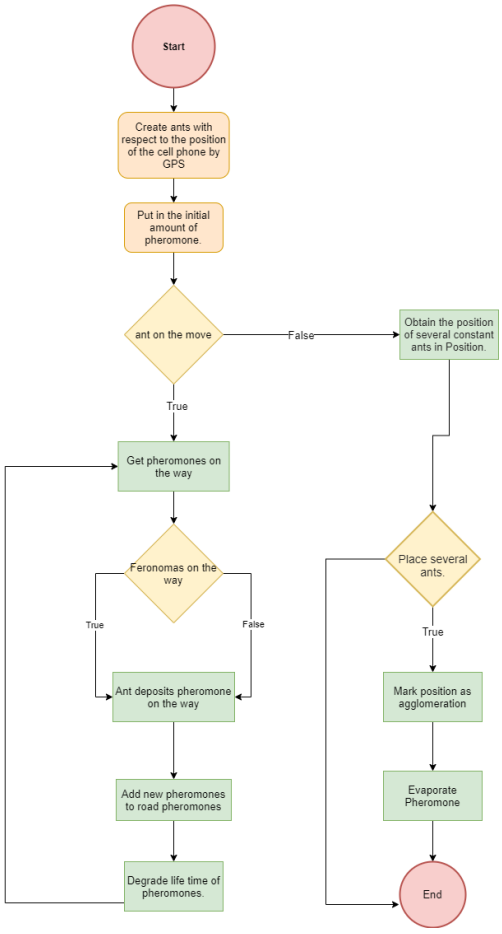
In the case of a recent crowding, the report button allows users to send confirmation messages and a brief description to warn the ordering services of possible crowds. An integrated neural network will determine the validity

of the report and consequently direct it to the services of the order of potential agglomerations.

The result of the **Find place** button allows showing places before visiting them and showing if they are safe or not.

Explanation of the solution

Using the optimization algorithm for ant colonies, we take advantage of its concept in a mobile application, where the cell phone would be the ant, which when they move around an area would leave pheromones on the path they travel, you are losing activation as time passes (This it will be a count that those pheromones carry). So, if other mobiles (which are carried by people) take that same path, they make the pheromones stronger. So, when mobile devices are constant for a time in an area, that place is marked on the map as an agglomeration of people, that point will be registered as shown in the figure.



Algorithm functionality flow chart

When other devices (Person) are going to pass through that place, the application sends you an alert saying that there is an agglomeration in that area and that it is at a certain distance, here the person can make the following decisions:

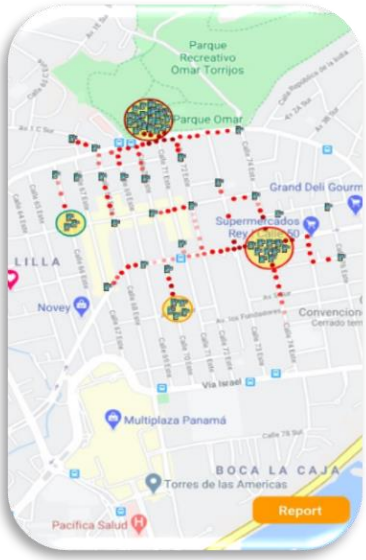
1. Take that route and confirm whether there is a crush or not (optional answer).
2. Take an alternate route and if you can confirm the possible crowding.

Based on the information collected as time passes, if many of the answers are affirmative (yes), the process of determining agglomeration and sending the alert to the authorities through Twitter is streamlined. On the other hand, if no one reports or claims that there is an agglomeration, and the algorithm continues to detect grouped devices after a certain time, it would also send a message via Twitter to the corresponding authority in the country in which it is located.

The algorithm would continue to work to update the data and if it detected the same agglomeration again, it would continue to send the alert, until it disappears and regenerates the information of the place.

If the assessment is successful agglomeration, the app sends a message via Twitter to the corresponding authority of the country in which it is located. All this taking advantage of the GPS of the mobile device.

Agglomeration example

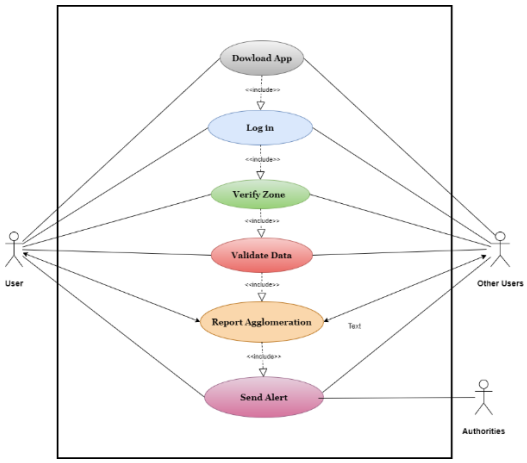


If no one reports or claims that there is an agglomeration, the algorithm continues to detect grouped devices after a certain time, send a message via Twitter to the corresponding authority in the country in which it is located. All this taking advantage of the GPS of the mobile device.

So, based on what other people confirm and the registration of the location of the mobiles, we carry out an evaluation to determine if there is an evaluation based on the new information.

The images that we presented of the use cases helped us to pose a little more about the behaviour of the application with respect to the system and seen from the user side.

System use case



Agglomeration Data Collection Process.

The alert by region will define a collection of sets, individuals or objects with certain characteristics that will be used for the predictive evaluation of possible propagation risks.

Real-time samplings will be carried out on said populations and in the same way apply the ant algorithm process to the sample that will determine an optimal evasion output.

We must consider the collected data as well as the present data and thus evaluate possible mutations in the behaviour of the contagion process.

The main objectives of obtaining this data are to warn the propagation sample in real time and that the different populations are alert.

The algorithm will allow a series of internal tests to be carried out until the most optimal solution is found, some of these tests will be confirmed by individuals in a population or the algorithm will make decisions based on past events.

Virtual quarantine fences (virtual map) will be established due to the high level of concentration of the pandemic in different areas.

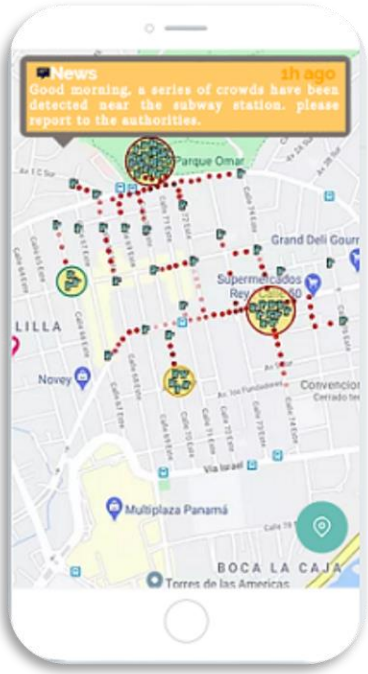
All the resources that the state has will be compiled and thus provide aid by sector according to the priority level.

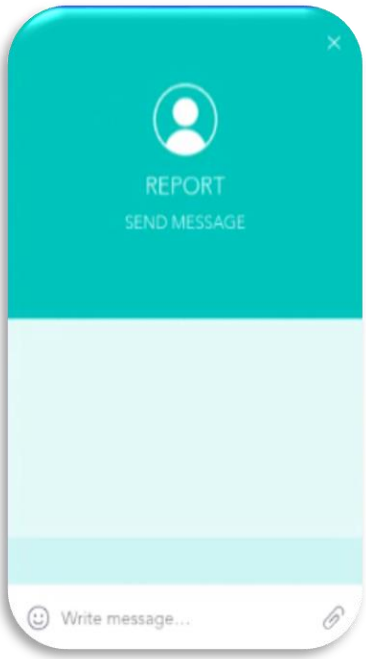
Optimal evaluations will be carried out, optimal routes, alerts to everyone of possible risks of contagion.

This picture shows the result of the prototype we have proposed.

Application prototype

Notifications and reporting section





Notifications **Report**

- Notification will be sent to people within a range where there are more agglomerations, the same will direct to the option, "Yes/No" to verify or not, if the information of the notification is correct.
- In the report option, the person may write the description of how many people observed at the agglomeration site or other specific details

Key prediction resources:

1. Data collection by sampling.
2. Process sampling through a predictive algorithm.
3. Always consider the history of mutation sampling.
4. Warning to different populations.

Future work

Once the application is already prepared, tested, and launched in the future with updates such as:

- The option that users can enter their own medical data whether they have a disease, the system can show you high-risk areas depending on their medical condition.
- Improve the detection system of high contamination areas to send alternative routes to people who are affected by said contamination.
- Improvements will be implemented in the application, which shows different views so that when marking a location, it shows points from that place with the highest record of crowds, these would be marked as high-risk sites for contagion.
- Add a voice assistant for better interactivity.

Problems of Challenges

- selecting a job idea
- Define the application's operating parameters
- Difficulty choosing a tool to work

Sources

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- https://blogs.iadb.org/conocimiento-abierto/es/coronavirus-recursos-y-conocimiento-abierto-para-colaborar-en-la-respuesta-a-la-pandemia/
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