HOMEHACK - GENERAL - SUBMISSION

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Project Description & Why this track

In ours and other developing countries, road conditions are far from ideal for walking, riding or driving over. These conditions include potholes, open manholes, hawkers and shops creeping onto the roads, trash and waste thrown around, animals walking amongst us and in certain cases, the lack of any tar roads altogether. In such a scenario, it becomes important for any routing and mapping algorithm to take into consideration these factors along with the traditional distance and traffic for deriving the best path between any two given points. We are creating a user sourced model of road conditions based on a user's location and accelerometer data along with some good old feedback and report forms. These accelerometer data in the X,Y and Z coordinates are passed through a model we have previously trained with labeled data and a percentage confidence in the quality of the road is spit out. This information is saved and harnessed later in conjecture with Google Map API's distance and time calculations to let the user choose between the shortest road which might be in a bad condition and a slightly longer road which might be in a better condition.

Uniqueness and practicality of the project

This feature would make millions of people's daily travel easier and more comfortable as it lets them make the decision to choose a road which is better or one which is shorter.
It is an extremely unique solution as anyone is yet to implement any kind of product in which they take into account the road conditions while routing to a user's destination for walking. It is also a very practical project as all the sensor required are already present on anyone who has a smartphone. The only bottleneck to this project that I can think of is obtaining the data for various user who may have different walking styles and gaits. To combat this we can, during the user registration process have a form which has the user classify themselves as young, old, health, athletic etc.

Future Scope

This project is extremely self-sustainable as we only need to pay for the initial development and hosting the server. The majority of the groundwork of collecting the data will be done by the users. However, as a business model we can have an enterprise version for companies which would have to pay a yearly subscription charge. E-commerce companies would be largely interested in a product like this as they frequently carry and transport goods which may be fragile and damage to the

goods translates into loses for them. Hence routing their trucks through better road conditions can be a cheap and easy way for them to improve their product.

Competition

Currently the only and the biggest indirect competition would be Google Maps. They are the giants in the maps and routing business but because I have built this application on top of the Google Maps API we are able to offer everything that Google Maps can plus more. We can say we are standing on the shoulders of giants and then reaching higher. We get our traffic and distance metric for a route from the Google Maps API and then independently calculate the individual road conditions for the different routes and indicate them in three different colours. This lets us have all the functionality that Google Maps has and then add a lot of our own which users in developing countries will cherish.

Demo link - https://youtu.be/IKF3uPlRoXU
Github repo - https://github.com/IEEE-cusat/homehack-general-submissions-sabmohmayahai