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# Routerich

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**Abstract:** *GPS-based navigation systems have become an integral part of our day-to-day lives. People frequently usethese systems to find their way around due to their usability and ease of use. Google Maps is currently the most widely used navigation system in the world. Alongside providing routes and navigation, it also provides information about traffic, weather conditions, and even feedback and reviews of the places you are visiting. But none of the existing navigation systems advises you about the underlying road conditions. Although they suggest the shortest route, it may not be the best route. Many times, you even end up reaching a dead end as a result of relying on these systems. In the midst of all this, a navigation system that can suggest routes not only based on the shortest distance but also based on underlying road conditions with real-time feedback has become a necessity. The goal of this paper is to efficiently searchfor the most accessible alternative paths in a multi-route navigation system.*

**Keywords:** Route Navigation System, Optimal Routes, Route Guidance System, Road Condition Detection, Route Planning

## I. INTRODUCTION

Nowadays, apps like Google Maps are widely used tofind the route from one place to another, and though these apps can be the best solution for finding the route, can they also suggest the best route? These apps will direct you in the right direction. There's no doubt about that, but can they suggest the best route? They will let you know if there is no traffic but won't suggest if there are no potholes on the same route. To indicate the paths while traveling on a road, numerous approaches have been utilized in the past. Roads are crucial for enabling individuals to travel between their homes and their places of work when they act as the gateway node between residential, commercial, and industrial locations. Road threats areinfluenced by several circumstances, including human error, weather, mode of transportation, vehicletype, and road conditions. That could also result in vehicle crashes with negative consequences forsurrounding communities and people's lives. Let's understand the problem with an example: If a pregnant woman is being taken to the hospital, wouldyou prefer a quick route with potholes or a bit longer route without any potholes? In this case, the lady's comfort is more important, whereas for someone whohas had a heart attack or suffered a concussion, the quickest route, regardless of road conditions, will be the priority. Drivers must be aware of anypotential dangers when traveling in areas where theremay be poor road conditions. While some collisions are unavoidable, educating drivers on what types of adverse road conditions exist as well as negative roadeffects will put them in a better position to avoid a crash entirely. People may fail to arrive at their destination on time due to poor road conditions. Google Maps is a web mapping platform that provides people with the best route to their destination; however, it does not provide people with a clear idea of the road conditions along the provided route.

## II. LITERATURE REVIEW

Google Maps is one of the most popular and widely used navigation systems worldwide. It was initially developed by Lars and Jens Eilstrup Rasmussen, formerly known as 'Where 2 Technologies.". In 2004, Google Inc. acquired this system, and this is how the famous Google Maps came into existence. The framework was developed with the C++ programming language and employs the following algorithms: Dijkstra's algorithm, which was initially used to find the shortest path between source and destination. But Dijkstra's algorithm fails as timeand space complexity increase. This is why now it uses the A* algorithm, which is a heuristic algorithm and can navigate you through a more efficient route.

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Google Maps introduced an amazing feature in2007 named Street View, which provides a 3D, HD, panoramic view of many neighborhoods, localities, streets, and much more. The team behind Google Maps has manually taken these images using a car that was specially fitted with camera rigs and other special equipment. Google Maps makes use of the civil GPS to track people and places. The GNSS Network (Global Navigation Satellite System Network) is the tracking system used by the GPS. Along with location information, this system can store speed, time, direction, and other parameters in its memory. Google Maps uses these and other advanced algorithms and technologies to provide you with the best possible route based on the shortest distance and traffic conditions, with superior accuracy and precision. All of this is covered in depthby Heeket Mehta, Pratik Kanani, and Priya Lande in their case study, Google Maps.[6] R Sulistyowati, A Suryowinoto A Sujono, and I Iswahyudi proposed a road damage monitoring system that makes use of GPS and advanced image processing techniques to detect potholes on the road and store their information with the exact latitude and longitude coordinates of the pothole. The system begins by using a GPS module to pinpoint the location of the pothole on the road. Then it uses a camera to capture an image of that pothole, after which an image processing algorithm is applied to the image to determine the characteristics of the pothole, like changing color contrasts between the surroundings ofthe pothole and inside areas of the pothole. The exact location and the details of the potholes are stored on SD card in the form of a CSV file, which acts as a data storage unit. Several tests were carried out for this system, and in daytime conditions and sunny weather, the success rate of pothole detection was 83.2%, whereas, under the condition of tree shadows, the success rate was 67% with a detection failure of 33%. In simple terms, it identified potholes in the majority of the test cases. [7] Many things can cause road damage. Among other things, there are cracked roads and bumpy, hollow roads. [5]

## III. RELATED WORK

The system under study will recommend routes to users based on each route's shortest travel distance and road conditions. Lack of this method prevents timely indications of functionalities like speed limit signs, living creatures crossing the road, heavy truck transit, floods that caused damage along the specific route, the status of old and new bridges that are now out of date, trying to warn of any accident locations that result from human error while driving, and other helpful activities. [1]

All of these are generated dynamically and reportedin our system via Google Maps. [2] The two parameters that the system will receive as input appear to be feedback from people who have already traveled that route and a second parameter. We want to build a system that functions exactly like the "LikeThis" feature in Google Maps, allowing anyone in this area to report problematic road aspects to the app with a precise location and image. Our system will display the location you're looking for in three different colors: purple, which is safe and can be long, and green, which is quick and secure. The third color is red, which indicates that the route is dangerous. In the second module, we'll also look for asolution to the problem of insufficient parking in urban areas. Based on previous user comments, users will be able to determine whether or not their locationhas a specific parking space. The proposed system allows users to search the routes between two places. Users can enter their origin and destination places in the application, and the system will then provide them with the possible routes between the origin and the destination. The routes shown will be mainly in three colors: green for the best route, red for the routewith bad road conditions, and lastly purple for the route that is either the long route, has bad conditions, or both. Here, one thing that has to be kept in mind is that many times the shortest route suggested by the system turns out to be a very uncomfortable ride because of its bad road conditions, which are either caused by excessive traffic because of the system's suggestion or simply because of a lack of maintenance. In any of these situations, users want to avoid such roads but are simply unable because of a lack of knowledge. Hence, we have proposed a system where user comfort will be the primary focus behind route suggestions instead of the shortest distance. Because of this, the best route you get from the system (in green) may not be the shortest route distance-wise, but it will ensure users a smooth ride from their origin to their destination. If the shortest route also has good road conditions, then the system will by default suggest it to all the users in green. After each trip, users will be asked to give feedback about their experience on a particular route. This feedback will be stored in the system and will be usedto improve the experience of upcoming users. Users will also be able to add images alongside their feedback for a particular route to make the experiencemore realistic. In the future, these images can also be used to determine the best routes by using advanced image processing algorithms.[1]

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## V. ARCHITECTURE

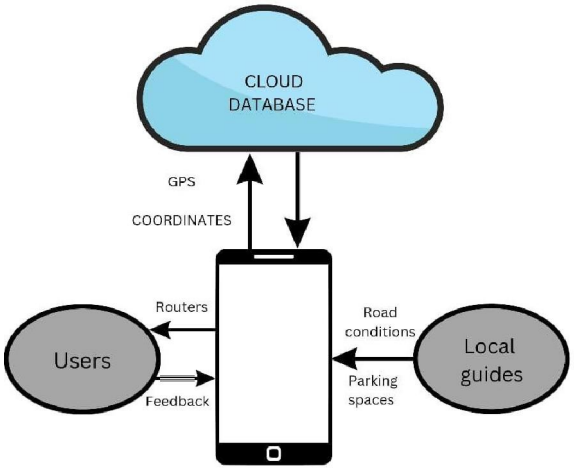


Fig. 1. Architecture of the Proposed System

As shown in Fig. 1. The user will access the URL and enter the start and destination locations. The the application asks for the user's start and end points before showing them all of the potential routes that are available or appropriate for travel. [1] To show how comfortable and quickly you will arrive at your destination, this route is depicted in various colors. The user can then choose the route based on their preferences. They ask the driver for feedback on the route they chose after they finish their journey. The application will save this feedback in the cloud and perform a sentimental analysis of the data todetermine whether the user's most recent experience on that specific route was good or bad, and the system will color the route accordingly, for example, red if the route is bad. To keep up with any changes in the state of the roads, the analysis can be done once a week.

The application will store all the routes and map information in a cloud-based system, where they can be accessed as and when needed. Users will be ableto search for their origin and destination by using the functionalities of our GUI-based system. Coordinatesfor the places can also be dynamically fetched from open-source APIs like Open Street View. On the other hand, the feedback given by users will also be saved in a cloud-based system where data analytics and machine learning operations can be easilyperformed on this feedback. Whenever users search for a route, the system will perform analytics operations on the latest feedback and display possible routes in different colors based on the results from the analytics engine. Users can choose any route fromthe provided routes, and once they end their trip, they can also give feedback to the system about their latestexperience, which will be stored in the system and used by the analytics engine the next time anyone searches the same route.

## VI. RESULT

Google Maps displays the shortest and longest routes and the route to take. [1]

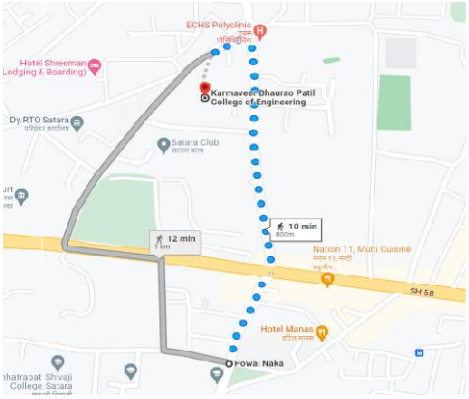


Fig. 2. Google Map

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Our system will also show the road condition when you enter the location where you have to reach and then show the routes via different colors such as purple, green, and red, which means that the route is safe but can be long, green shows the safest and quickest route, and the red route is for bad road conditions and indicates that the route is not safe. As you can see in Figure 3, we enter the location to travel from Powai Naka Satara to the KBPCOE Satara location.

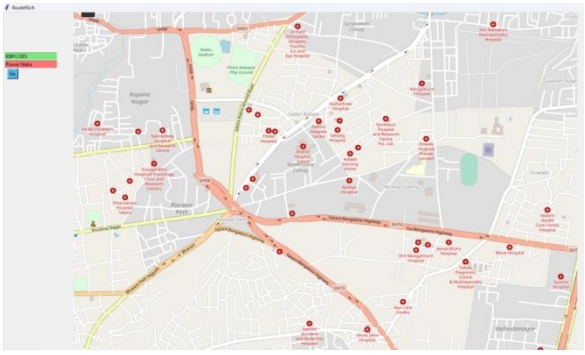

Fig. 3. Search Location

In this situation, our system suggests which road conditions are safe to drive on by displaying the route's color: purple for a safe and lengthy route, green for a safe and efficient route, and red for a bad road

Fig. 4. Suggests Routes

The users also have the functionality to provide feedback on the route on which they have traveled. If the user clicks on any of the routes suggested by the system, they will be able to see the condition of that route as well as give feedback on these routes.

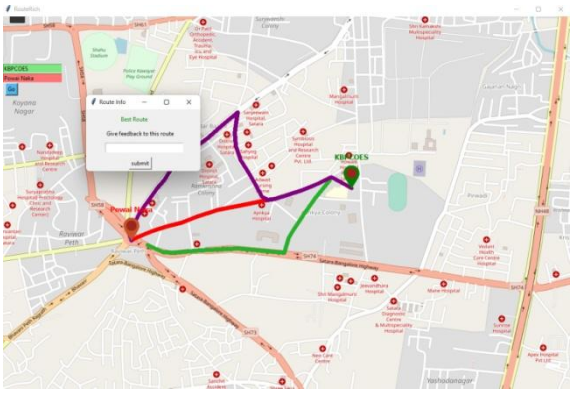

Fig. 5. Route information and feedback popup (BestRoute)

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**Fig. 6.** Route information and feedback

## VII. ADVANTAGES AND DISADVANTAGES

| Advantages | Disadvantages |
|---|---|
| It assists you in determining the best route based on road conditions. | Users must have a smart device to use the system. |
| Users or guides can add photos and give feedback on the road. | Good internet connectivity is required. |
| Through this project, real-time traffic and road conditions can bedetected. | System establishmentwill take time. |
| Good vehicle conditions will bemaintained. | |

## VIII. CONCLUSION

The challenge and driving force behind this project are that the vast majority of existing navigation systems cannot provide accurate routes and depict the state of the roads. This project's major objective is to build a precise, reliable, and enlightening navigation system. This navigation system is going to operate as a mobile application. Additionally, we provide a feedback and review feature that enables everyone to report poor road conditions with a precise pinpoint location. This system will be incredibly helpful in the future and will be crucial in giving you a safe and enjoyable trip.

## REFERENCES

**[1].** https://www.researchgate.net/publication/348549197_Monitoring_of_road_damage_detection_systems_using_image_processing_me thods_and_G
**[2].** https://www.researchgate.net/publication/332662441_Visual_Safe_Road_Travel_App_Over_Google_Maps_About_the_Traffic_and_ External_Conditions
**[3].** On the analysis of road surface conditions using embedded smartphone sensors | IEEE Conference Publication | IEEE Xplore
**[4].** https://iopscience.iop.org/article/10.1088/1757-899X/1010/1/012017/meta#::text=The%20method%20used%20in%20this%20paper%2C%20which%20uses,sensor%2C%20as% 20geotagging%20location%20and%20CSI% 20camera% 0interface.
**[5].** https://www.researchgate.net/publication/33 3117435_Google_Maps
**[6].** Detection of Potholes and Speed Breaker on Road | Semantic Scholar