Saarathi

The COVID-19 Safe Routing App

Concept Report

INSPIRATION FOR SAARATHI

Almost six months ago, India went on a strict lockdown and now, when the situation is arguably catastrophically unsafe, people are free to be back on the roads, and this poses a perplexing dilemma with only one answer—learning to live safely with COVID. Our app *Saarathi* is a navigation app that focuses on helping people do this. This dilemma inspires Saarathi's goal—to help India learn to live with COVID-19 and to make sure that if people are not home, they are still safe. Carefully analysing navigational topography, threat and convenience, Saarathi points users to safer areas and guides them away from the jaws of COVID-19 prone red flags. It uses 6 versatile factors to assess routes based on comprehensive algorithms and finds a path for them to safely get to their destination.

The Indian central government, state governments and local governments currently have more than 62 anti-covid apps but all of them are focused on tracking COVID-cases and providing related information. To effectively fight COVID, especially now, there is a need for more active solutions in all areas of people's lifestyle; we believe that Saarathi could be a great addition to the fleet of apps working against COVID because it actively provides safety where it is needed the most—out on the roads.

The second iteration of the Application focuses on increasing its functionality and usage exponentially. This entails making it more information-oriented, the addition of heatmaps and review of the number of cases in a district. We referred to our application as "*Saarathi*"—exerting inspiration from *lord Krishna* who steered the mighty *Pandavas* out of all threats and guarded them against all the dangers of war. Likewise, we are seeking to assist our users by showing them suitable routes and help them win this *Mahabharata* against the Covid-19 Pandemic.

WHAT IS SAARATHI?

A Mobile App

By Indians, For Indians

A mobile application developed as a social welfare initiative by us, Indian undergraduates, as a Response mechanism to COVID-19.

A Promise

To Fight the Pandemic

To effectively fight COVID, especially now, there is a need for more active solutions.

WHY SAARATHI?

For Safety

Through Proprietary Navigation

For keeping the Indian population safe in this COVID-unlock process by providing them with navigation solutions.

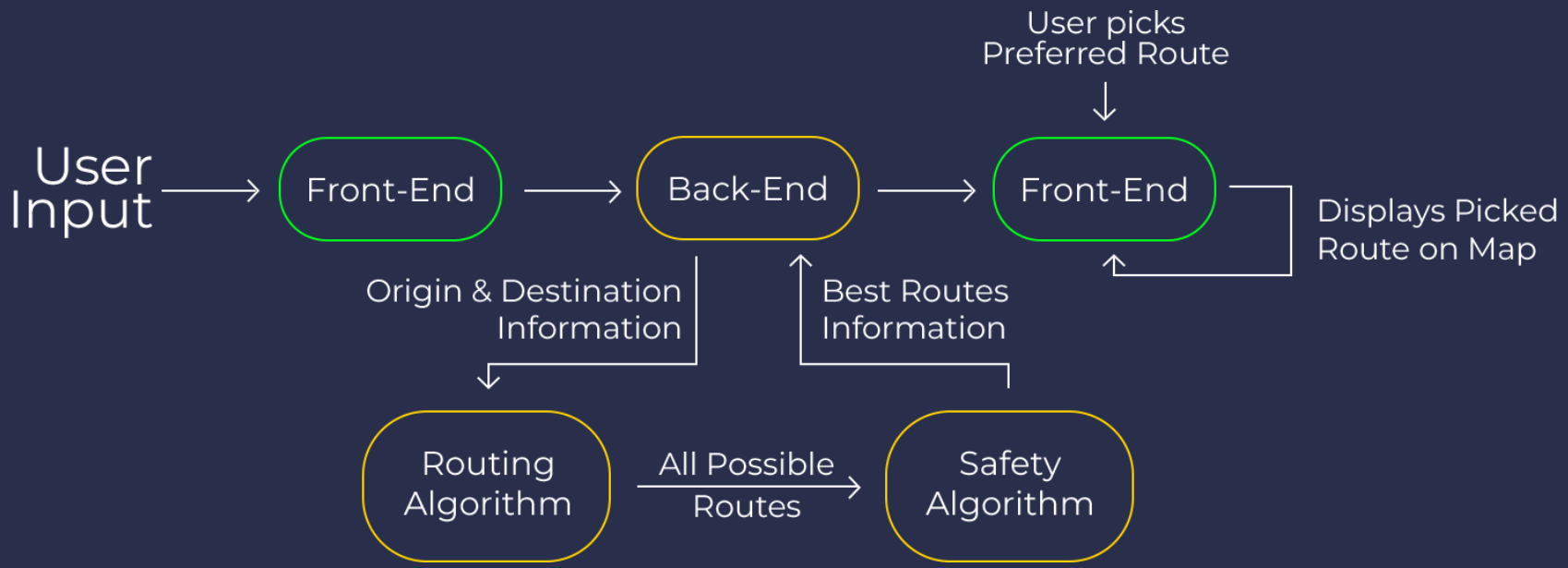
Acclimatising

To the New Normal

To help people learn to live safely with COVID-19 and to get back back on their schedules - their normal lives.

BACKEND & FRONTEND

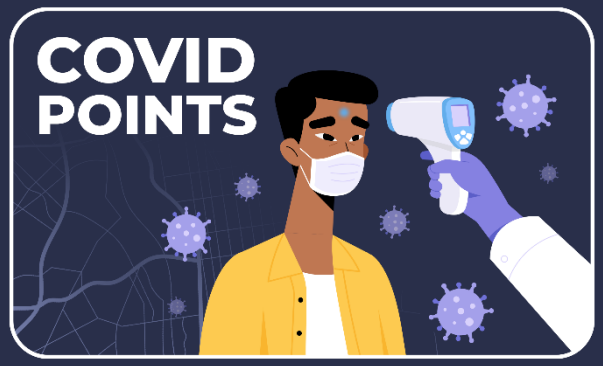
Our team works in two wings: Backend and Frontend. The backend takes in the input, considers all possible routes from origin to destination, processes all these routes with an algorithm and returns the optimal route. In essence, the backend builds the solution product for our application—a machine that gives us a safe path. The frontend is the interface wherein the user inputs their route details and the solution, the best route, is displayed. The frontend is also responsible for all app feature coding and development. Instead of a simple analysis of one factor that may lead to a “safe” routing system on the face value, we have invented a comprehensive system which analyses an amazing amount of routes and accounts for a variety of factors to find a COVID-free route for users. The following diagram shows the flow of the app:



SAFETY ALGORITHM

One of the fundamental and sought-after characteristics of our application is the safety algorithm. It evaluates essential metrics and renders a rating to each route. Here are the factors we will consider while finding the best route for the user in the algorithm:

Avoids highly populated areas based on EU satellite imaging and India Census.

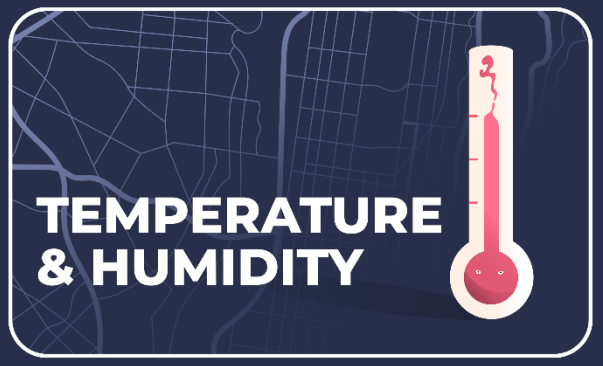


Fetches district-wise case rate data from government sources & avoids highly active areas.

Avoids hotspots like hospitals, public transport facilities, open malls, etc. in vicinity.

Dodges traffic to avoid on-road contact and to reach destinations faster.

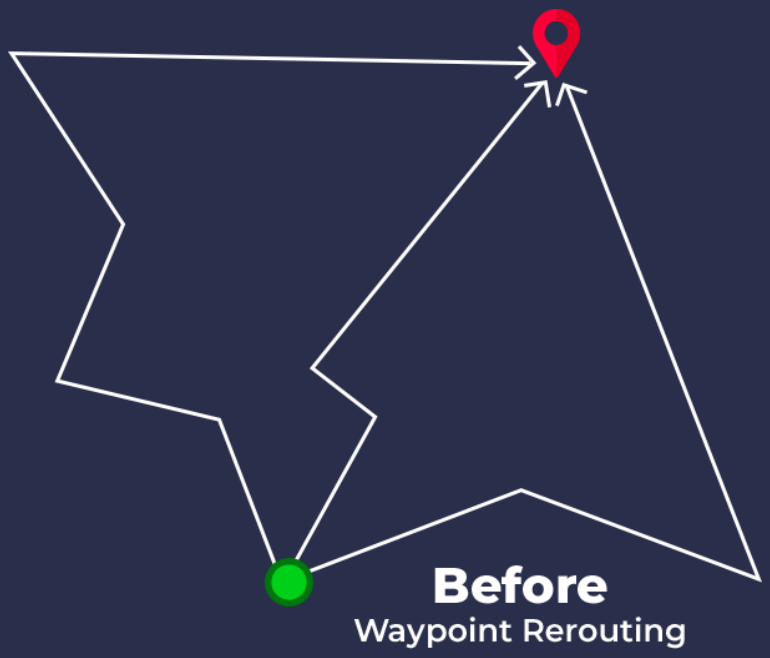
Eliminates routes through government designated red zones with high positive-case density.

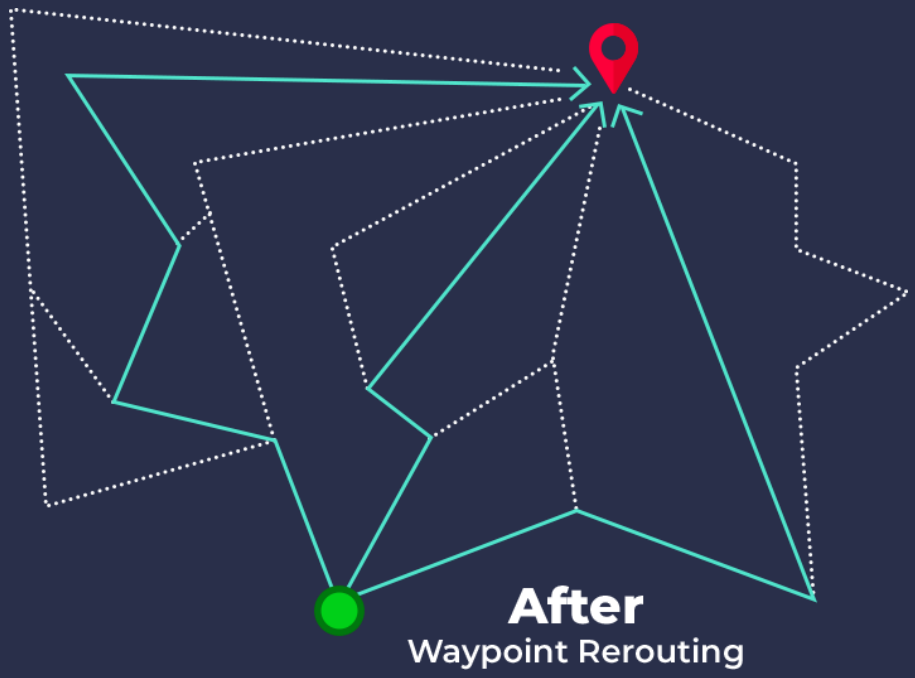


Both factors are fit into a Loess regression model and climate dependent spread risk is calculated.

ROUTING

To get all possible routes between the origin and the destination, we use a recursive algorithm – we reroute on waypoints. This means that on a given route, we try to find new directions on every turn. So, when one route would have just had us take a left on a turn, we ask Google for new directions from that turn's location again and see if it considers going straight and turning right as possibilities too. If yes, we add those to our list of routes. This leads to an exponential rise in the number of routes.

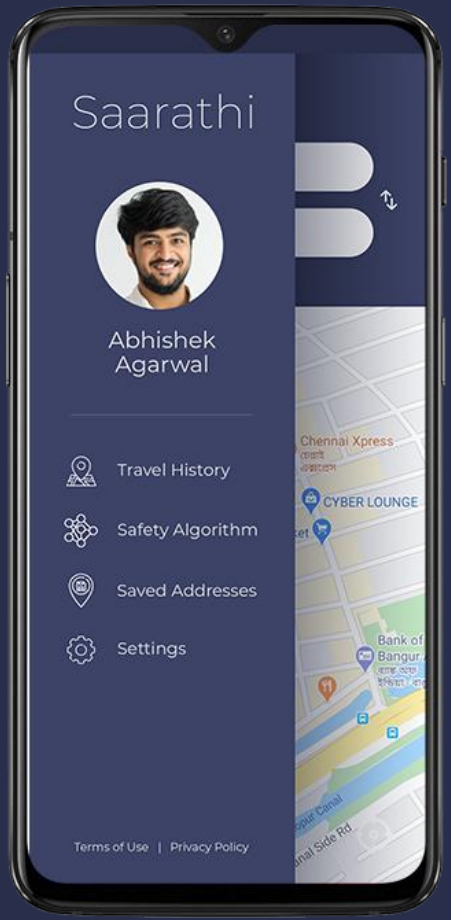




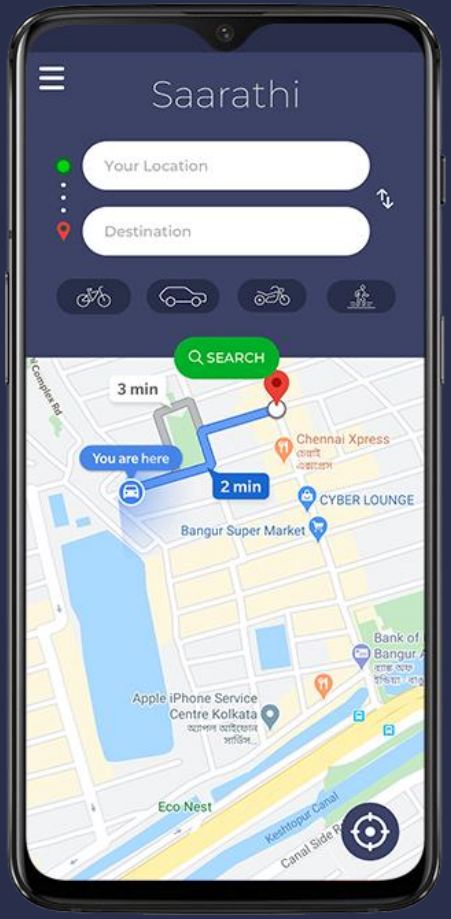
FRONTEND

MOBILE APPLICATION:

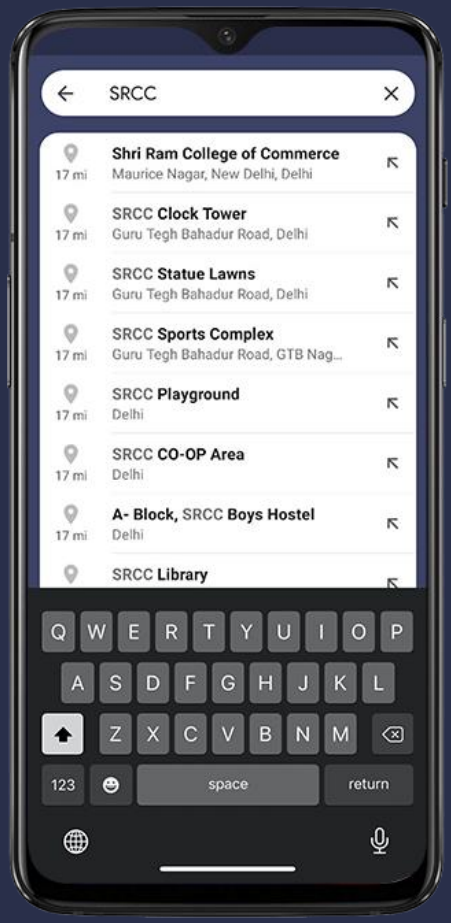
Log-In/Sign-Up Page



Dashboard Page



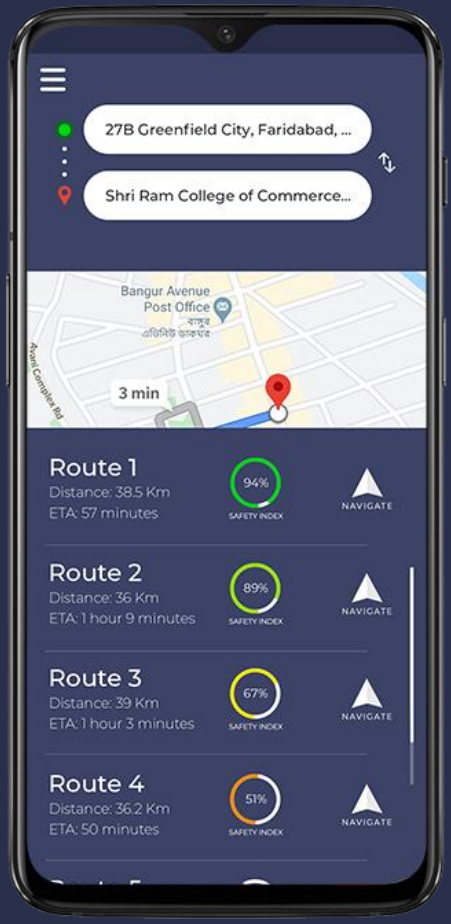
Welcome Page



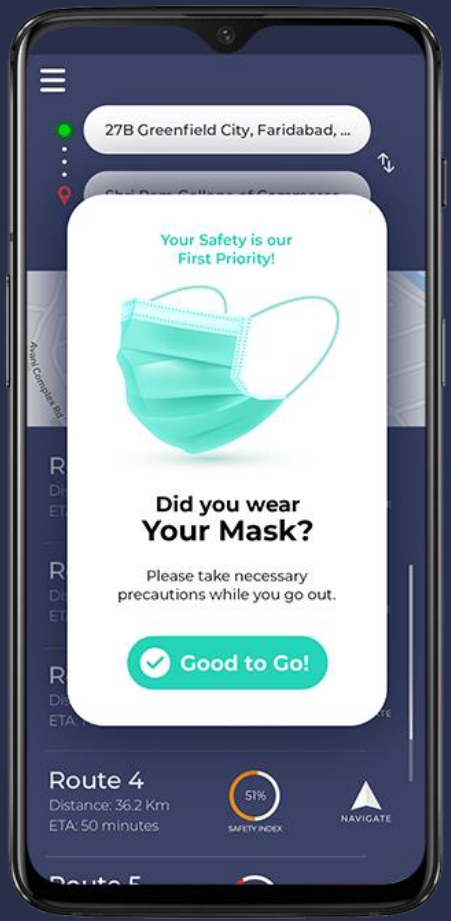
Search UI

FRONTEND

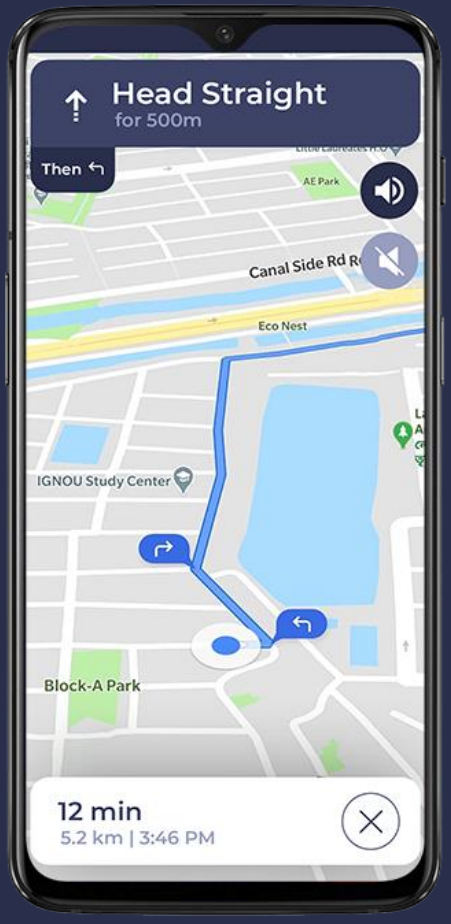
MOBILE APPLICATION:



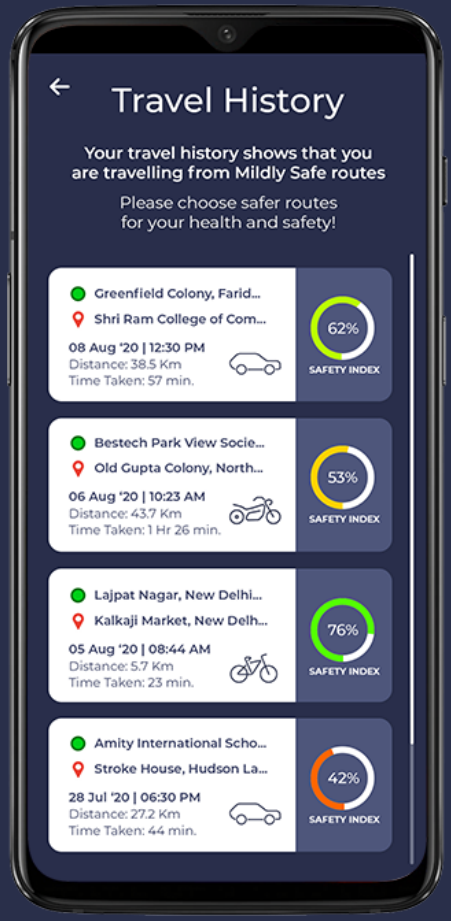
Route Options Menu



Mask Reminder



Navigation Page



Travel History Page

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