ECharge – An Electric Vehicle Charging Station Finder Application

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Abstract. Even though electric cars are growing more and more common, many drivers still have trouble finding charging stations. Because of this, customers need an EV charging station finder app that is user-friendly and dependable, and that can provide them with the most recent information on the location and availability of charging stations specific to the type of electric vehicle they are driving. An dependable and user-friendly app that can assist EV drivers in finding charging stations is becoming increasingly necessary as more and more people choose to use electric vehicles (EVs). Although there are now a few apps for this usage, they frequently have limited functionality, lack real-time information, or are challenging to use. For EV drivers, this might cause aggravation and annoyance as they can find it difficult to map out their routes or locate. This app would be a helping hand for EV drivers.

1 Introduction

A software program called an electric vehicle (EV) charging station finder app is made to help owners of EVs find charging stations for their cars. As electric vehicles gain popularity as a more environmentally friendly form of transportation, these applications have developed into indispensable resources for EV users to efficiently plan and navigate their travels [1]. Providing real-time information on the closest charging stations, their availability, the different kinds of charging stations, and other pertinent details is the main goal of an EV charging station finder app. This gives EV drivers the ability to decide where and when to charge their cars, ensuring that they have enough fuel for their travels [2-3]. A ground-breaking tool created to expedite the adoption of electric vehicles in a world growing more environmentally conscious is the Electric Vehicle (EV) Charging Station Finder App [4]. This app helps EV users find charging sites fast and effectively, which is a basic concern [5]. The application facilitates user engagement, real-time information, and smooth navigation, so enabling users to make educated decisions, improve convenience, and contribute to a sustainable future [6]. In terms of environmentally friendly transportation, the Electric Vehicle (EV) Charging Station Finder App is a ground-breaking solution. [7]. The app becomes a lighthouse as the world adopts greener energy sources, removing a significant obstacle to EV adoption. For owners of electric vehicles, navigating

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the terrain of charging stations is a top priority. This software takes on that difficulty head-on [8]. The app gives users the confidence to embrace electric transportation by easily linking them with nearby charging points and providing vital station information. This helps to contribute to a cleaner planet and a brighter future for automobiles.

2 Literature Review

2.1 Plug Share:

PlugShare is a mobile and web application that lists locations and specifics of electric vehicle charging stations. The application was created and is still being maintained by Recargo, Inc., a company that joined EVgo Inc. in the middle of 2021. The PlugShare map can be filtered by drivers based on the type of plug they are using (CHAdeMO, SAE/CCS, etc.) and the rate of charging (Level 1, Level 2, DC Fast Chargers, such as Superchargers for Tesla). Additionally, you have the option of filtering by charging provider. All of the major EV charging networks in North America, Europe, and most of the rest of the world are fully detailed with station information on the PlugShare map.[9] The application makes use of user-submitted content and the databases of multiple networks for charging electric vehicles, including home chargers that are open to the public [10].

2.2 EVgo App:

When charging your electric vehicle while on the go, EVgo offers a dependable, quick, and simple solution. Find EV charging locations, view charger details in real time, make a reservation, and start charging right now! Become a part of the EVgo network today, with 310,000 client accounts and counting. All battery electric vehicles (BEVs) and EV connectors (CHAdeMo, CCS, and Integrated Tesla Connectors at some sites) are compatible with EVgo charging stations [11]. Connect Your Vehicle with EVgo To display just EV charging stations that are compatible with the plugs on your EV, scan your VIN. Use a QR code to gain free admission to fast chargers inside guarded facilities, and your EV charging session will be extended.

2.3 ChargePoint

It's quickly rising to the top of consumers' favorite apps these days. It has more than 10,000 recharge stations spread across throughout. A real-time map can help you narrow down your options by charger type, price, and many other factors. It is among this app's best features. With the help of this app, you can join a waitlist and find out if the stations are filled. Its auto top-off feature is helpful for customers who are constantly on the go and have a hectic schedule [14]. Thanks to the ChargePoint app, drivers can easily choose from hundreds of thousands of stations and roaming partners on the largest EV charging network in the world. It's never been simpler to locate, use, and pay for EV charging. You can now leave your wallet at home because the ChargePoint app is the only all-in-one driving solution with premium driver features and seamless tech integrations [15]. using the ChargePoint app, get alerts and reminders in real time regarding your charging status, such as when a station opens, when your car is fully charged, and how much a charging session will cost. using the ChargePoint app, get navigational assistance and experience ChargePoint's global app and roaming network by receiving station recommendations with photographs from other drivers.

2.4 Chargeway:

The very first driving needs-specific app for charging electric cars. "Chargeway is absolutely game changing as it cuts through the clutter," declares Car & Driver Magazine. Use plug-specific color coding to identify the Green, Blue, or Red stations that correspond to your vehicle. Power levels 1 through 7 display the maximum charging speed for your car and the station, add reviews and images to the stations you visit, see nearby stores and restaurants that you can enjoy while charging, automatically filters the station location map for the cars you choose, easily adjusts filters for station power levels and networks you want to use. One-click directions that will assist you in reaching any station [17]. To switch between your many electric cars, just swipe left or right. Chargeway finds the quickest route and the locations of charging stations for your trip; you can also customize routes by adding multiple stops between your starting point and destination; the charging times for each stop are estimated to help you plan your time more effectively; and you can view all of the charging options along your route by selecting "All Stations" on planned trips.[18].

3 Implementation of The System

3.1 Requirements for Software and Hardware

3.1.1 Hardware Requirements

Processor – IntelCoreI3 or Above
RAM – 4 GB (min)
Hard-Disk - 1 TB (min)
GPU for Good Cost/Performance

3.1.2 Software Requirements

Tools – Chrome or Microsoft Edge
Platform – MobiRoller
Modules – Map, Standard Content, FAQ, Setings

4 Visualisation and Analysis

4.1 Images Showing Output Screens

The following figure.1 shows the output screen of the Login Page in an Android Mobile Phone.

Fig. 1. Output Screen of the Login Page

The following figure.2 shows the output screen of the Main Page after completion of the Login Authentication.

Fig. 2. Output Screen of the Main Page

The following figure.3 shows the output screen of the Home Page with the details of the App name and the App Icon.

Fig. 3. Home Page with App Icon

The following figure.4 shows the output screen of the User Location by using GPS.

Fig. 4. User Location

The following figure.5 shows the output screen of the Nearby Charge Stations including the details of the Company whether it is available or not.

Fig. 5. Charge Stations Nearby

The following figure.6 shows the output screen of the Settings which we can control the Profile and the Notifications.

Fig. 6. The Settings

The following figure.7 shows the output screen that is Navigating to the Nearby Charge Stations by using the Google Maps.

Fig. 7. The Settings

5 Result

An app called Electric Vehicle Charging Station Finder helps electric vehicle drivers find places to charge their cars. They can adapt how easy the app is to use, how happy users are with it, and how it affects how often they charge their cars and how easy it is to find charging stations. The main goal of this project is to make it easy and convenient for electric vehicle (EV) owners to use an app that provides practical features. The app will also be useful for the people who manage the charging stations. It can collect information about the owners of the charging stations and the electric car drivers who use them. The app can also help people find charging stations and navigate to them. In the future, the app will be improved and turned into a paid service with additional features that will cost money, such as the ability to charge and cool things.

6 Conclusion

In conclusion, the Electric Vehicle Charging Station Finder Application is a practical and creative solution for owners and enthusiasts of electric vehicles. It promotes sustainability and lowers obstacles to EV adoption while meeting the growing demand for easy access to infrastructure for charging. This software is a must-have for anyone looking for dependable and effective charging options because of its user-friendly layout, location-based services, and real-time data updates. Such an app's scope and objectives go beyond simple convenience; they assist more general environmental and societal goals, for example, reducing carbon emissions and promoting the use of renewable energy, and advancing sustainable mobility options. Furthermore, in order to develop a more sustainable and effective transportation environment, The Electric Vehicle Charging Station Finder Application is regularly produced in cooperation with stakeholders such as EV manufacturers, charging station operators, and government agencies. The Electric Vehicle Charging Station Finder Application is an essential tool that will shape mobility in the future, spur innovation in the infrastructure for charging electric vehicles, and enable

consumers to make environmentally responsible decisions as the market for these vehicles grows. Its importance comes from both its practicality and its ability to create a more sustainable and clean environment.

7 Future Scope

The future scope of an Electric Vehicle Charging Station Finder Application is promising and will likely see continuous growth and innovation in several key areas:

7.1 Integration of Renewable Energy:

With an increasing emphasis on sustainability, Information regarding charging stations using sustainable energy sources, such solar or wind power, may be included to the app in the future. This would align with the growing interest in eco-friendly charging options.

7.2 Enhanced Route Planning:

Future versions of the app may provide even more sophisticated route planning features. This could include optimizing routes based on real-time traffic conditions, weather, and charging station availability.

7.3 Electric Vehicle Support:

As electric vehicle technology advances, the app may need to adapt to support new vehicle models, different charging connector types, and varying charging rates. It might also incorporate features tailored to specific vehicle brands and models.

7.4 Payment Integration and Subscriptions:

The app may further streamline the payment process for charging sessions. It could facilitate mobile payments directly within the app, offer subscription-based charging plans, and provide discounts or loyalty rewards for frequent users

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