# Electric Vehicle Charging Station App

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***Abstract:*** *Recent technological advancements like electric vehicles are vying for attention. Fewer nursery outflows, fuel reserve cash, and convenience are a few positive aspects it offers. Recent efforts to stop the introduction of greenhouse gases that cause global warming and to conserve petroleum products, whose value is rising, have accelerated the development of sustainable power offices. Additionally, photovoltaic system prices are rapidly falling. Therefore, it is agreed that photovoltaic energy will become less expensive in the future. But in Japan, the enormous surplus power produced by solar systems has a catastrophic effect on the power infrastructure. This concept presents a sustainable power source for an EV charging station. It also provides a few chances for the provision of electric power from environmentally friendly sources of electric vehicle charging stations. The power is then utilised to charge electric automobiles. An introduction to energy management and management techniques for the power supply of charging stations for electric vehicles are also provided in this essay. In order to exchange energy from fuel and reduce pollution from carbon emissions, wind turbines and solar photovoltaic arrays are used in combination.*

## 1. INTRODUCTION

There are currently not enough charging stations in India, leaving it difficult for people to find one that will save them time and money. For EV charging stations, areas like parks, malls, and communities are required. The parking lots of associations, homes, or public or commercial places are where you can find private and semi-public charging outlets. Because of this, it's getting harder for EV consumers to find nearby charging stations. Finding charging stations is an issue, but so is recharging quickly because electric vehicles need time to recharge. Users of EVs find this inconvenient because it takes a long time and necessitates a dedicated spot in order to charge the EV. India's 4,444 new registrations are rising as well, thus this rising number is not apparent on the virtual map. India's electric vehicle sector is expanding but the number of charging points is declining. This makes it harder for the user to virtually find the charging station. Customers who purchase electric automobiles must maintain them differently than those who purchase conventional vehicles. To discover a charging station, people must ask for assistance, such as using an app that locates charging stations for electric vehicles. Instead of searching on our own, we can save time by using an electric vehicle charging station locator app.

Due to this problem, we must schedule when to replenish (charge) these vehicles, but with the help of our programme, we can find nearby EV charging stations quickly. This essay will go into great detail about the app for discovering electric vehicle charging sites. Electric car charging station finder app will show you charging stations near us and near your location.
Owners of electric vehicles will benefit greatly from this app in terms of time savings. In this project, we'll create a tool that's beneficial to both consumers and charging station operators. All previously

scheduled customers will be able to charge their cars at vending machines thanks to the app. The application offers consumers and dealers a welcoming and simple to use interface.

## 2. LITERATURE SURVEY

1. Dr. Omar A. Ibrahim and Khalid J. Mohsen have designed and implemented a location-based web service using Google Maps for Android mobile. This article describes an Android app designed to let users of Android phones add, remove, and view particular location on an online map. The programme also offers basic navigational functions like displaying instructions with the shortest route between the source and Calculate location and distance and travel time. In order to provide solutions, this programme integrates and makes use of the Google Maps API, the Google Directions API, PHP, JSON, and MySQL.

2. A mobile GPS navigation system based on Google Maps is being developed and put into use. by L. Zhijian and H. Li Numerous tools are available through the Google Maps API to add custom content to Google Maps. We can communicate with Google Maps' services using a series of application programming interfaces (APIs). Thanks to this, we will be able to create everything from easy location-based web, iOS, and Android apps.

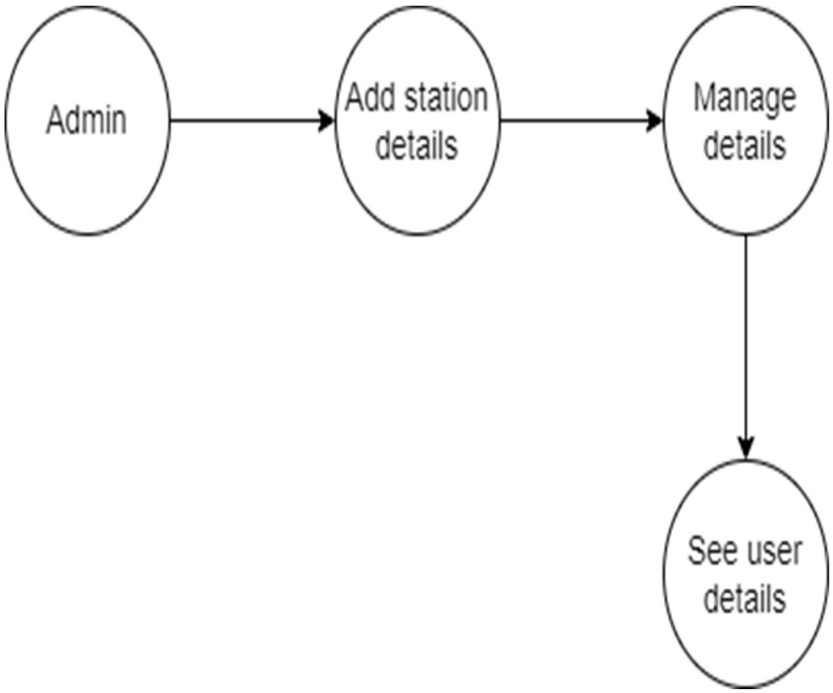
The Google Maps API provides many tools to add original content to Google Maps, and many web applications can search based on the Google Maps API. Assisted global positioning systems (A-GPS), It is the most accurate positioning technology for mobile positioning services, preferred by mobile owners. In this paper, a mobile navigation system is proposed, which provides capabilities like Google map browsing and searching, bus line searching, quick local placement on your phone, etc. In this essay, we describe the system technical framework and the main realisation technologies. The Nokia N73 then shows the test results.

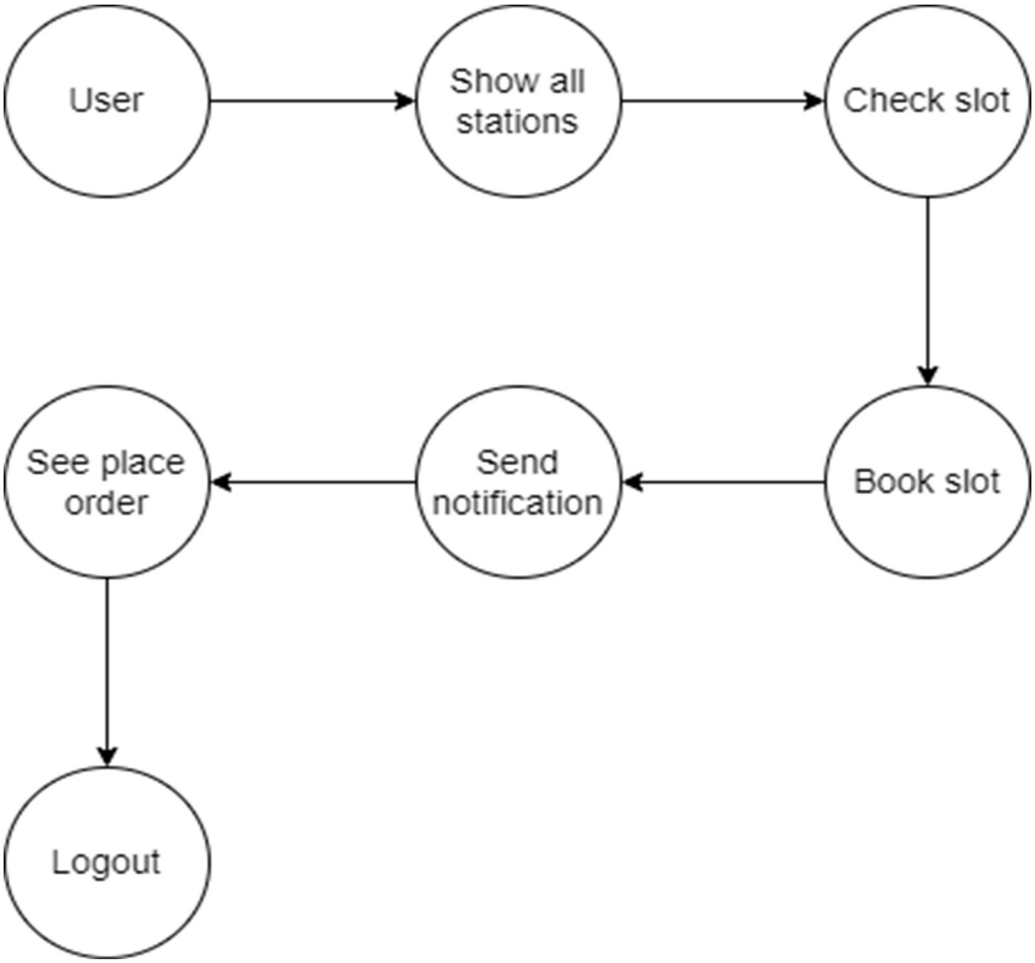
3. The Global Positioning System (GPS) is used to operate a web-based application in P. Cooper and A. M. Qadir's paper, "Web-based Application and GPS-Based Mobile Cross-Platform Cargo Tracking System." The GPS system is made up of more than 30 navigation satellites in earth orbit. We know where they are because they are constantly transmitting signals to us. Your phone's GPS receiver keeps an eye out for these signals. After determining the distance to up to four or more GPS satellites, the receiver can precisely locate your location. Cross-platform development, which offers a unified code base that can operate on several systems at once and saves money and time, is becoming more and more popular among developers. It eliminates the need to write code separately for each platform.

# 3. SYSTEM IMPLEMENTATION

### 3.1 Existing Methodologies

We intend to Build an app that helps users find power stations and provides a satisfying user experience using its special features. Here, we go over the method we used to finish our project. A variety of relevant sources, some of which were connected to apps, were sought out by our team. We categorised the references and then choose those that About the topic of this article. The search method is applied by employing related terms. Examining each reference's suggested topics for discussion and choosing those that can be applied to the process completes the sorting approach. We filtered data before starting to develop thoughts and the design of this app. Our team has started building an app by fusing ideas from selected sources and applying them sequentially in accordance with the demands of our project. Our EV finding app will feature real-time availability of charging stations for electric vehicles, firebase email authentication, a navigation system, a slot booking and deletion system, profile management for users and vendors, an online payment system, the ability to add new stations and maintain reservations, and a profile management system. Below is a list of the fundamental tasks that a user or vendor can complete.






## 4. METHODOLOGY

**User can interact with:**
Map and navigation are included. You can book slots, delete slots, and add stations.

**Customers can contact:**
• Booking List
• Ability to Remove Bookings
• Ability to Add Stations

**Profile Selection:**
Customer or Vendor When the app is opened, we must first choose whether we are a user (the owner of an electric car) or a vendor (the owner of an electric vehicle charging station), and then we must log

in if we have already registered or register if we haven't. A backend firebase email authentication procedure allows a legitimate registration user to log in.

## User

### A. Map Activity:

The initial activity in the app after selecting a user and signing in is a map activity.This page has a built-in full map, markers for every station that is currently open, and a separate list of all of them. The user can choose a station that is close by.

1. Station : This activity opens when you click on the next station. This activity contains all station-related information, including station images, locations, and distances to users' homes. Availability of ports at this station, Cost of renting the slot feature and charging the EV per hour.

2. Slot Booking : This activity opens when the book slot is clicked. This activity requires you to fill out booking information to reserve a charging slot, including the car company, model, kind of charger, and charging slot time.

3. Navigation Feature : From the user's current location, this feature will direct them to the station. This launches Google Maps and initiates the turn-by-turn navigation function.

### B. Booking List Activity

This activity contains information about every user's reservations at charging stations, and users can also cancel reservations from here.

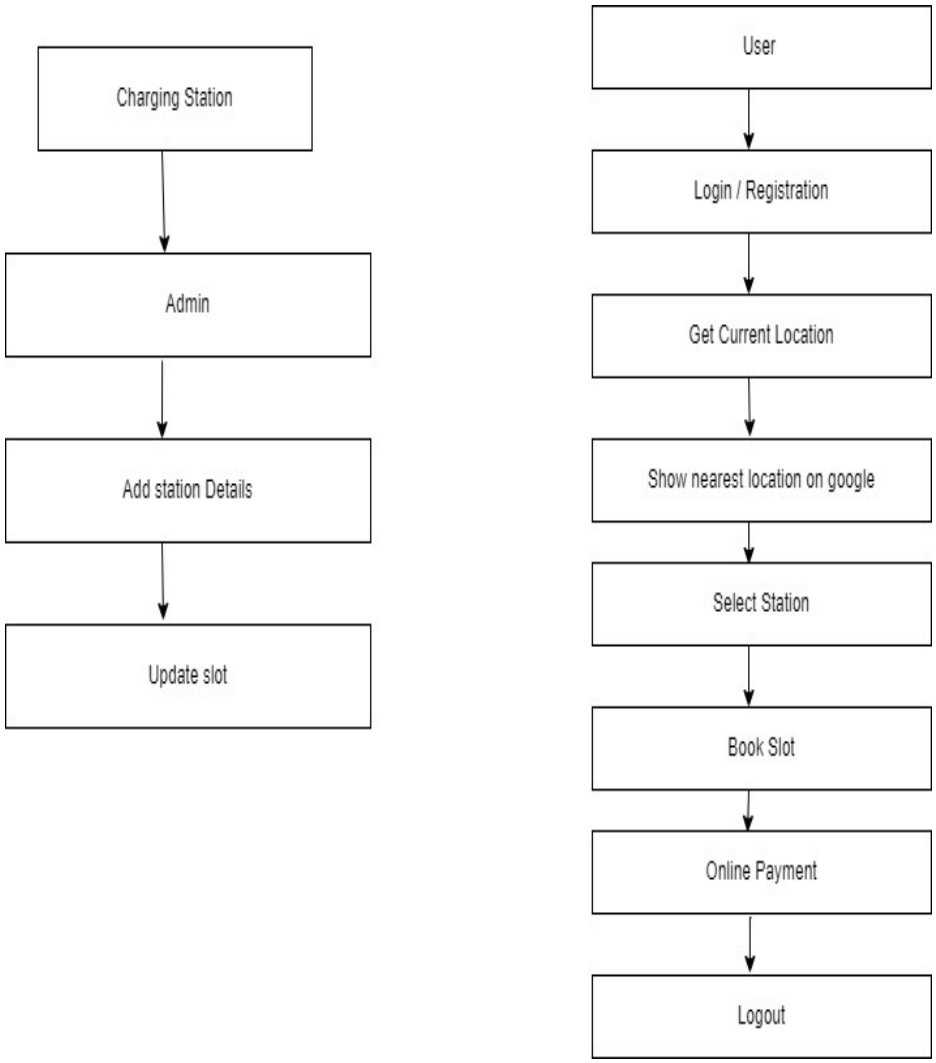
### C. Profile Activity

1. Contribute Feature : The user can utilise this function to add additional stations to the app's database and map. This function helps with the inclusion of new stations in India, as the EV industry is growing and new stations are popping up there.

2. Profile : This has all information of user such as name, live user location and you can edit it also.

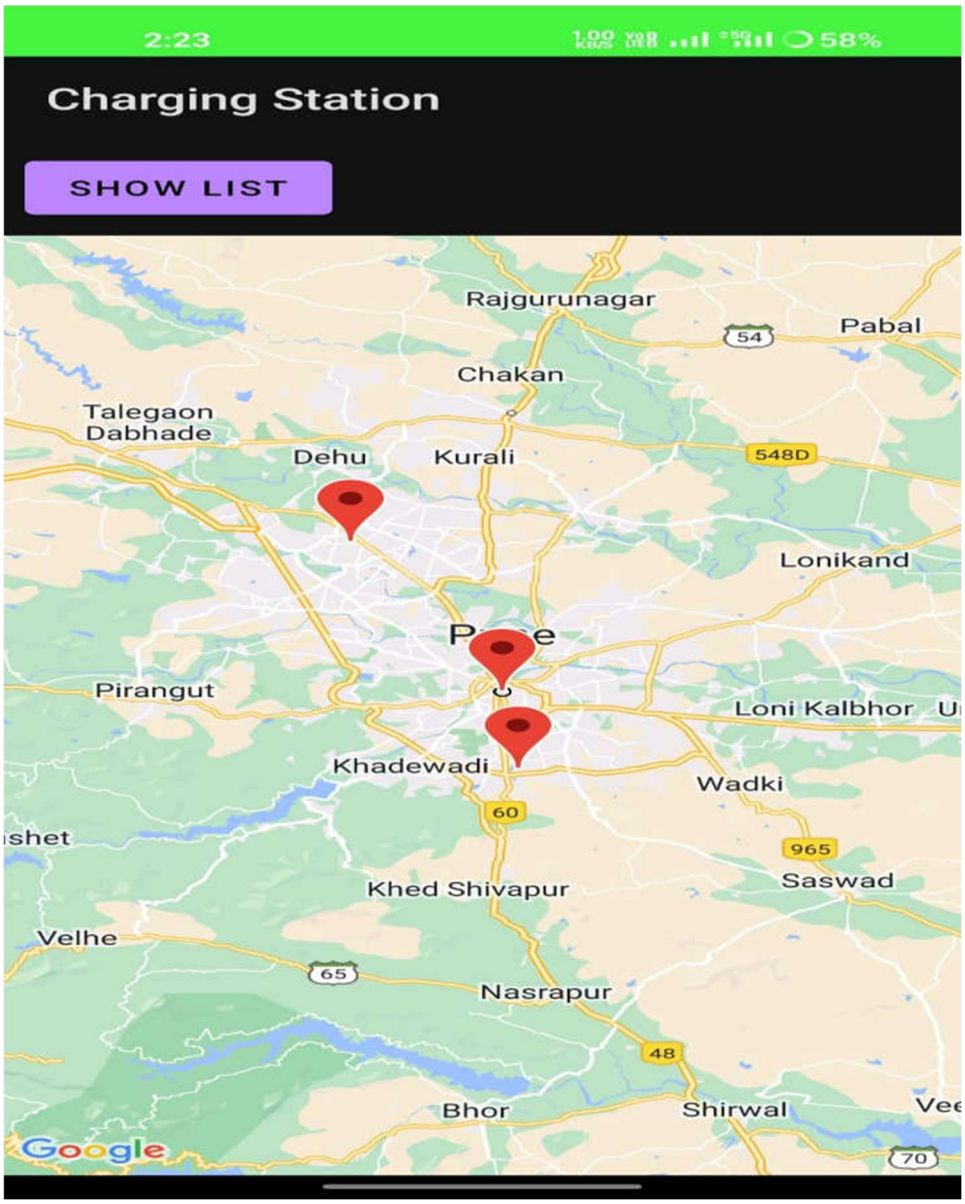
# 5. SYSTEM DESIGN

**PROPOSED SYSTEM ARCHITECTURE:**



## 6. RESULTS

With the help of the concepts and techniques we'll employ, we'll be able to communicate directly with the app, which will be highly engaging, dependable, and user-friendly for both buyers and sellers of electric charging stations. The architecture will be used to develop and deliver services such as real-time location tracking, Google Maps, navigation, slot reservation and management, and profile management. As we gather more information about the electric vehicle charging stations, the app will be more efficient and interactive with all of these services. The user will find it simple to navigate and make reservations at these locations. This will boost the vendor's sales as well.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Charging Station
SHOW LIST
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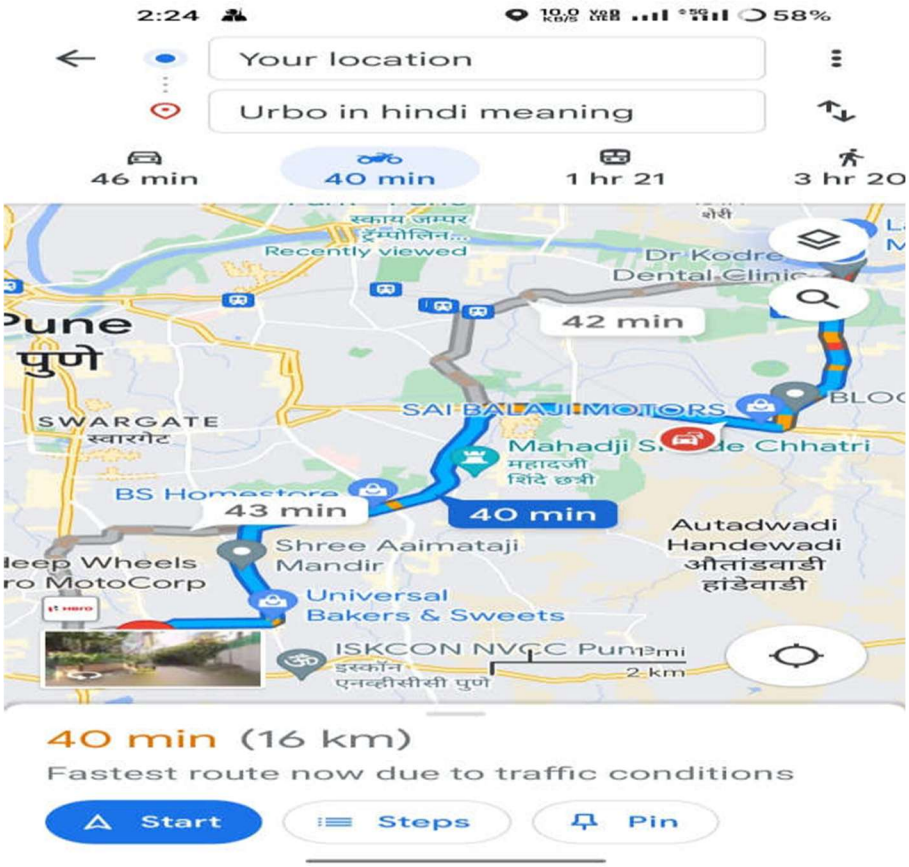


## 7. CONCLUSION AND FUTURE SCOPE

**Conclusion:**

The issue of charging EVs has grown in importance as the number of them on the road increases. For satisfying the daily charging requirements of all connected EVs, a charging station with solar panels, a battery storage system, and additional grid assistance is a realistic alternative. PID can be used to control current and voltage in order to supply the proper quantity of power by maintaining the station's DC bus voltage constant. To make the design and algorithm robust, the site's design and power management are determined and analysed in MAT-LAB / Simulink with 5 different operating modes and status 2 of EV policies in mind.

**Future Scope:**

Its main purpose is to charge the battery of the electric car to control the movement of the car. While most electric batteries can only charge direct current (DC) power, some electric vehicles (EVs) are equipped with a charger that converts direct current (AC) power to now and then transfers that power to the vehicle's port..

# 8. REFERENCES

1. Location Information Service Platform Based on GPS/BaiduMap [J]. Huang Wenhui. Computer application & Software.2015
2. Yongmin Zhang, Lin Cai, ” Dynamic Charging Scheduling for EV Parking Lots With Photovoltaic Power System,” 2017 IEEE 86th Vehicular Technology Conference (VTC-Fall), 2017, pp. 1–2.
3. G.R.Chandra Mouli, P.Bauer, M.Zeman, ”System design for a solar powered electric vehicle charging station for workplaces,” Applied Energy Volume 168, 15 April 2016, pp. 434–443.
4. S. Akshya, Anjali Ravindran, A. Sakthi Srinidhi, Subham Panda, Anu G. Ku- mar, ” Grid integration for electric vehicle and photovoltaic panel for a smart home,” 2017 International Conference on Circuit ,Power and Computing Tech- nologies (ICCPCT), April 2017.
5. Gautham RamChandra Mouli, Peter Vanduijsen, Tim Velzeboer, Gireesh Nair, Yunpeng Zhao, Ajay Jamodkar, Olindo Isabella, Sacha Silvester, Pavol Bauer, Miro Zeman, ” Solar Powered E-Bike Charging Station with AC, DC and Con- tactless Charging,” 20th European Conference on Power Electronics and Ap- plications (EPE’18 ECCE Europe), 2018, pp. 1–10.
6. Wajahat Khan, Furkan Ahmad, Mohammad Saad Alam, ”Fast EV charging station integration with grid ensuring optimal and quality power exchange,” International Journal of Engineering Science and Technology, 2017. Volume 22, Issue 1, February 2019, pp. 143–152.
7. Mukesh Singh, Praveen Kumar, Indrani Kar, ” A Multi Charging Station for Electric Vehicles and Its Utilization for Load Management and the Grid Sup- port, ” 2013 IEEE Transactions on Smart Grid, 2013, pp. 1026– 1037
8. N. Shlayan, K. Challapali, D. Cavalcanti, T. Oliveira and Y. Yang, "A novel illuminance control strategy for roadway lighting based on greenshields macroscopic traffic model", IEEE Photon. J, vol. 10, no. 1, Feb. 2018.
9. H. Belkamel, K. Hyungjin, K. Beywongwoo, Y. Shin and S. Choi, "Bi-directional single-stage interleaved totem-pole ac–dc converter with high frequency isolation for on-board EV charger", Proc. IEEE Energy Convers. Congr. Expo, pp. 6721-6724, Sep. 2018.
10. D.M. Kim, P. Benoliel, D.-K. Kim, T. H. Lee, J. W. Park and J.-P. Hong, "Framework development of series hybrid powertrain design for heavy-duty vehicle considering driving conditions", *IEEE Trans. Veh. Technol*, vol. 68, no. 7, pp. 6468-6480, Jul. 2019.
11. Hengbing Zhao, Andrew Burke, ”An intelligent solar powered battery buffered EV charging station with solar electricity forecasting and EV charging load projection functions,” 2014 IEEE International Electric Vehicle Conference (IEVC), December 2015, pp. 1–7.