EV-Go Documentation

By Vaughan Hilts, Giovanni Romano, Brandon Smith

**Description**

EV-Go is a web application for electric car drivers. It allows them to plan trips with their electric car, creating a route that passes through charging stations. It takes into account the properties of their car, such as its range on a full charge and its compatibility with different types of charging stations.

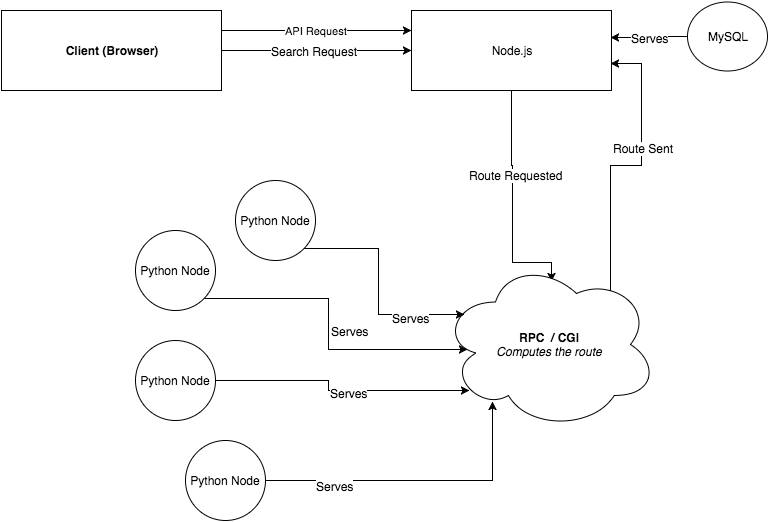
**Features**

* can choose car by model and specific spec
* displays map with route through necessary stops
* can export route to Google Maps
  + import into devices for navigation
* auto complete for search boxes using Google Maps API
* works on mobile devices
* server is multithreaded

**Architecture**

* Node.js (API server)
  + zeroMQ/zeroRPC (message queue)
  + Restify (API framework)
  + MySQL (database engine)
  + Mocha (unit tests)
* Python
  + Google Maps API
  + Open Charge Map API (data source)
  + A zeroRPC server

**Architecture Diagram**



Using EV-Go

**Getting Started**

The user begins at the main screen with just four fields – that’s all that is required to get going. So, just:

* Begin typing a starting location and have it auto complete to where you want to go.
* Begin typing a destination location and have it auto complete to where you want to go.
* Select a car and its associated spec / model from the given dropdowns.

Then, just click **Search.**

*Please note that for longer trips the searching process can take some time. A loading indicator is shown to let you know work is being completed.*

**Navigating your Route**

If results came back, proceed below. Otherwise, you may get a modal with an error message. It’s likely the route you selected is impossible or deemed too risky to travel. Try a different route.

When the search results come back successfully, you will be presented with a list of stops in a list and a visual representation of the trip on a map.

*Navigating the Map*

You can drag and pan the map, along with zoom in. The chargers you will need to stop at are clearly marked with a charger icon on the map, you can zoom in on the map to see their exact location relative to the route.

*Importing the Directions into a GPS or General Purpose Device*

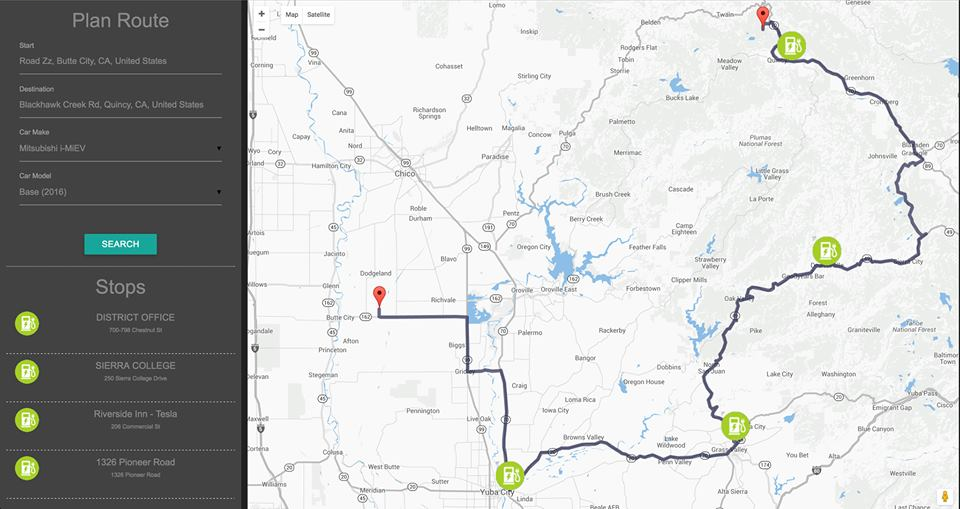
At the bottom of the **Stops** pane is a provided **Export Route** button. This button does one of two things depending on the platform:

* **Desktop**: On a desktop platform, a Google Maps tab will be opened in your browser allowing you to view in detail, all the directions required to get to your location. You can then save this within Google Maps and load it on any Android device or Google enabled GPS.
* **Mobile:** On mobile, the Google Maps application will be opened. You can do something similar to save or begin navigation immediately.

Examples and Highlights

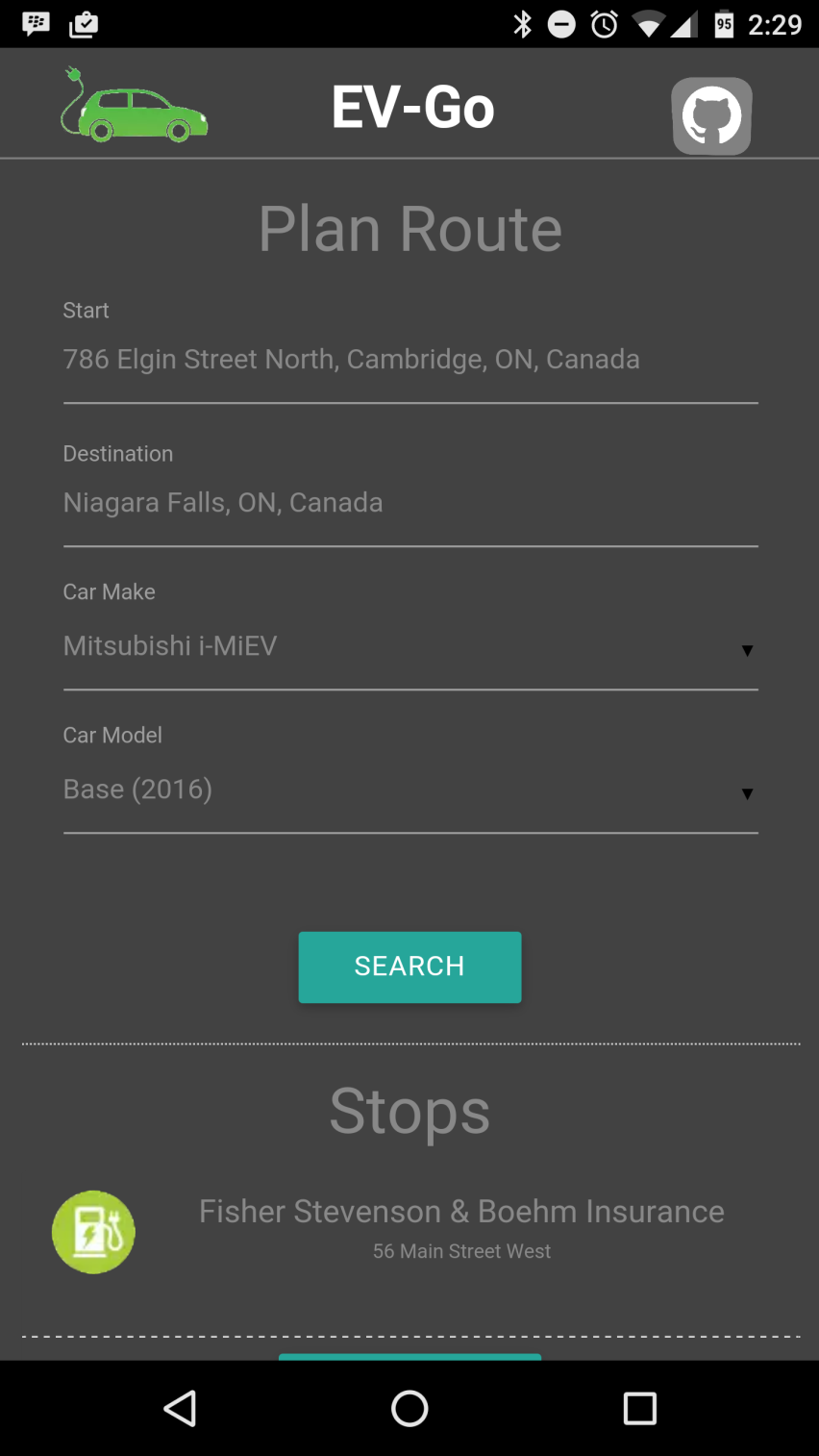
**Navigating Mountains**

Below, we show a navigation route navigating a mountain range in California. You can observe that there is a shorter path going directly through, but since the range of the car is too short and there are not enough chargers, it is not possible to drive this. So, the algorithm routes it around. This highlights that a naive beeline for the end would **not** be good enough.



**Mobile Support**

The world is becoming more increasingly mobile. A mobile version of the application ensures that users will be to check in and find their way home or to some location on the go, any time.



**Long Trips: Fully Supported!**

With more chargers available around the globe now, going long distances is completely possible. Below, we show a trip from Cambridge to Quebec City. It stretches nearly 1,000 kilometers – much too far on a single charge or even multiple!

