Simple GPS Data Receiver Software

Author: Boi Tran Van - 43905634
          Alex Subaric – 43946598
          Clint Catchpole – 43637850
          Thomas Wolhuter - 42926016

INTRODUCTION:

Simple GPS Data Receiver Software is developed by ENGG4810 Team 03. This software allows you to retrieve GPS data package from the hardware device via the MQTT server. Then, using the data from packages, the software will generate a KML file and human-readable CSV file.

In addition, to allow more effective testing your device, the software can alternatively accept a CSV file of messages that were published to the MQTT server. Whether the format of the CSV file is: <unix_timestamp>, <topic>, <base64 encoded data>\n

Beside from the actual path, the KML file also contains:

- An absolute extruded path for each of hardware sensor's data. The height of the extruded paths is corresponding to the magnitude of the sensor data, (if sensor data magnitude is negative, the software will convert it to positive).
- Path of RSSI for each unique SSID.
- The number of skipped measurements at a location. To make the extruded path more visible, the height will equal the number of skipped measurement multiple for 50.

DEVELOPMENT ENVIRONMENTS:

The software is developed by using Python 3.5. The software was developed upon several library packages:

- tkinter: Python's standard and most commonly used GUI packages. Tkinter is a free software released under Python license. Source code can be found at https://github.com/python/cpython/tree/master/Lib/tkinter
- csv: Python's module allows applications to read and write tabular data in CSV format. It is under Python license. Source code can be found at https://github.com/python/cpython/blob/master/Lib/csv.py
- datetime: Python's module allows applications to manipulate dates and times. It is also under Python license. Source code can be found at https://github.com/python/cpython/blob/master/Lib/datetime.py
- base64: Python's module provides applications to encoding binary data to printable ASCII characters and decodes such encoded data back to binary data. It is also under Python license. Source code can be found at https://github.com/python/cpython/blob/master/Lib/base64.py
- simplekml: Python package was created to allow applications to generate the kml file. simplekml is licensed under GNU Lesser General Public License. Source code can be found at https://bitbucket.org/KyleLancaster/simplekml
- paho-mqtt: Python package developed by Eclipse Paho, it enables applications to connect to an MQTT server and to subscribe to topics and receive published messages, as well as publish the message to an MQTT server. Source code can be found at https://github.com/eclipse/paho.mqtt.python

INSTALLATION:

Software doesn't require installation, but the user may need to unzip the folder if they download software in a compressed file.

INSTRUCTION:

- Once downloaded, the user can run "TP2.exe" in dist/ folder
- The user can connect to MQTT server by click "File > Connect MQTT" (figure 1)
  - Note: Currently the software only access to "tp-mqtt.zones.eait.uq.edu.au" server and only subscribed to "/engg4810_2018/G03" topic. In order to gain access permission to "tp-mqtt.zones.eait.uq.edu.au" server, the user must connect to UQ network or VPN.
- The user can disconnect by simply click "File > Disconnect MQTT" (figure 1)
- Once connected, the user can start collecting data by click "Start" button. The user can click "Start" again to delete the old set of data and start to collect the new set of data.
- The user can pause collect data by click "Pause", and resume collecting data again by click "Resume".
- Alternatively, User can import encoded csv by click on "File > Import encoded CSV" (figure 1)
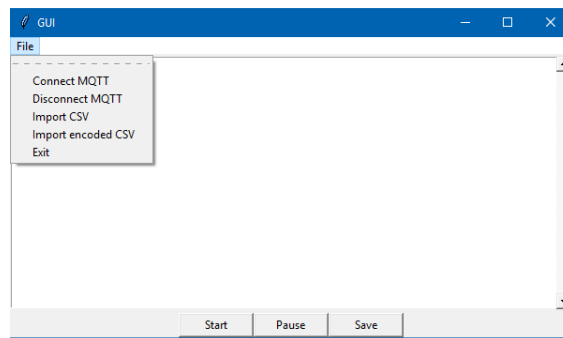

Figure 1: Interface

- Once data is collected (or imported), the user can generate KML and CSV files by click on Save, the files will store in the same folder as the TP2.exe file.