PRO FORMA FOR THE APPROVAL OF THE FINAL SEMESTER PROJECT

(Note: All entries of the pro forma of approval should be filled up with appropriate and complete information. Incomplete Pro forma of approval in any respect will be rejected.)

Project Proposal Number : _____
(Filled by the Department)

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Academic Year : 2023

Year of Admission : 2021

Admission Number : 16704

Roll Number : 21MCA11024
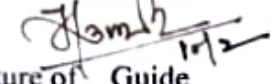
Register Number : MES21MCA2024

1. Name of the Student (in BLOCK LETTERS) : MOHAMMED ASHIQ ALI K

2. Name of the Organization : MES COLLEGE OF ENGINEERING, KUTTIPPURAM

3. Address of the Organization : KUMBIDI-THRIKKANAPURAM RD, KUTTIPPURAM, KERALA 679582

   Telephone No. : _____   Company E-Mail : _____

4. Name of the External Guide : _____

   Mobile No. : _____   E-Mail : _____

5. Title of the Project : Transportation Mode Detection using Deep Learning

6. Name of the Guide : Mr. Balachandran K P

Date : 10/ 02 /2023

Signature of the Student : _____

Comments of The Project Guide

Initial Submission :

Approval Status : Approved / Not Approved   Dated Signature of Guide   HOD

First Review :

Second Review :

Comments of The Project Coordinator

Initial Submission: Approved

First Review

Second Review
Coordinator

Dated Signature of Project
Co-ordinator

Transportation Mode Detection Using Deep Learning
MOHAMMED ASHIQ ALI K
MES21MCA-2024
ABSTRACT

Understanding transportation modes is beneficial for empowering many intelligent transportation systems. Current transportation technologies are costly and inaccurate, and transportation technologies need high network bandwidth to produce accurate results. This method uses data from smartphone sensors rather than GPS.

This project is to detect transportation mode using a preprocessed data set. The dataset required for this project is created from the data generated from the accelerometer of smartphones, collected through an application. A deep convolutional neural network framework applied on the accelerometer data to detect transportation modes in near real time. There are 6 major transportation modes like stationary, walking, bicycling, taking the bus, driving a car, taking the subway, and taking the train, to travel need to select an optimised transportation mode by considering the travel time and cost.
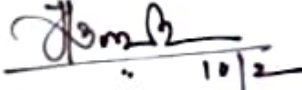
Currently GPS is used to select and calculate the transportation duration and select transportation mode, but GPS have some limitations like, Non-availability of GPS signals everywhere, the requirement of an unobstructed view to satellites, limiting its applicability in metropolitan areas with highrises or in shielded areas, significant amount of energy consumption of GPS sensor, which may rapidly deplete the battery of a mobile device. To overcome these limitations of GPS use the accelerometer sensor data from smartphone frequently and apply CNN on the collected dataset.

The above mentioned data is created using the following procedure, 8 reference points and 3 different ways to reach each point from a common destination, 24 sets of data are collected for analysis. This dataset can be generated using an android application. This dataset needs to preprocess, to detect transportation mode. The generated dataset contains a gravity component which is generated by earth, this component not needed for the detection of the transportation mode, so as a part of preprocessing the dataset need to remove the gravity components from the dataset and smooth the dataset by removing the large fluctuations which is caused by sudden movements.

The major steps are Data collection, Preprocessing, Preliminary data analysis. Preprocessing include removing gravity, data smoothing, taking magnitude and data slicing. The deep learning model used in this project is a deep convolutional neural network (CNN).

A mobile application is needed to develop and must be installed on the mobile phone of the person who wishes to select transportation modes. Users can freely hold the smartphone in any orientation as their preferences. So that application can collect a large variety of data. Android application records the accelerometer data, and current transportation mode is manually labeled by the user. Accelerometer data is collected about every 2 hours. Matlab/Python combination is used to preprocess the data and CNN is built using Tensorflow. The data available are primarily splitted into 80% as training and 20% as testing sets.

Six transportation modes can be detected using the accelerometer sensor. The accuracy of the GPS system is less than 90%, and needs improvement when using the accelerometer sensor. This accelerometer based method can detect all common transportation modes, including being stationary, walking, bicycling, taking bus, driving a car, taking subway, and taking train. A root map can be generated using the dataset.

Balachandran. KP
Proj Guide