Claims

1. A processing apparatus for generating route navigation data, comprising a processor and a memory, the apparatus being configured, under control of the processor to execute instructions in the memory to:

generate training data based on road network data corresponding to a network of roads in a defined geographical area, and journey data sets, each journey data set comprising data indicative of a journey by a road user through the network of roads and being derived using geolocation transmissions from a communications device of the road user;

train a classifier model based on the training data;

apply the trained classifier model on road data corresponding to a road in the defined geographical area, for the trained classifier model to predict a direction of traffic flow on the road; and

generate the route navigation data indicative of the predicted direction of the traffic flow on the road.

2. The processing apparatus as claimed in claim 1,

wherein, for generating the training data, the processing apparatus is configured to generate road data sets from the road network data and the journey data sets, and

wherein, for each road data set, the road data set is associated with a respective road in the network of roads.

3. The processing apparatus as claimed in claim 2, wherein, for each respective road, the road data set comprises:

count data indicative of a count of the geolocation transmissions associated with the respective road; and

entropy data indicative of an entropy in a direction of traffic flow on the respective road,

wherein the count and the entropy are derived from the journey data sets.

4. The processing apparatus as claimed in claim 2 or 3, wherein, for each respective road, the road data set comprises:

length data indicative of a length of the respective road;

first road count data indicative of a first road count of incoming roads associated with nodes constituting the respective road;

second road count data indicative of a second road count of outgoing roads associated with the nodes;

percentage data indicative of a percentage of the incoming roads and the outgoing roads being roads for uni-directional traffic flow; and

probability data indicative of a probability of the respective road being a road for uni-directional traffic flow according to a road type of the respective road,

wherein the length, the first road count, the second road count, the percentage, and the probability are derived from the road network data.

5. The processing apparatus as claimed in any one of claims 1 to 4, wherein, for applying the trained classifier model on the road data, the processing apparatus is configured to apply the trained classifier model on the road data to generate prediction data indicative of a predicted probability of the road being for uni-directional traffic flow or bi-directional traffic flow for predicting the direction of traffic flow on the road.

6. The processing apparatus as claimed in any one of claims 1 to 5, further configured to, in response to a request from a user to access data associated with the road in the defined geographical area, communicate the route navigation data to a device of the user for communicating the predicted direction of the traffic flow on the road to the user.

7. The processing apparatus as claimed in any one of claims 1 to 6, further configured to process the route navigation data to generate at least one of visual information or audio information for communicating the predicted direction of the traffic flow on the road to the user.

8. The processing apparatus as claimed in any one of claims 1 to 7, further configured to process the route navigation data and data indicative of a digital map representative of the defined geographical area for displaying the digital map with information corresponding to the predicted direction of the traffic flow on the road.

9. A method for generating route navigation data, the method comprising:

generating training data based on road network data corresponding to a network of roads in a defined geographical area, and journey data sets, each journey data set comprising data indicative of a journey by a road user through the network of roads and being derived using geolocation transmissions from a communications device of the road user;

training a classifier model based on the training data;

applying the trained classifier model on road data corresponding to a road in the defined geographical area, for the trained classifier model to predict a direction of traffic flow on the road; and

generating the route navigation data indicative of the predicted direction of the traffic flow on the road.

10. The method as claimed in claim 9,

wherein generating the training data comprises generating road data sets from the road network data and the journey data sets, and

wherein, for each road data set, the road data set is associated with a respective road in the network of roads.

11. The method as claimed in claim 10, wherein, for each respective road, the road data set comprises:

count data indicative of a count of the geolocation transmissions associated with the respective road; and

entropy data indicative of an entropy in a direction of traffic flow on the respective road,

wherein the count and the entropy are derived from the journey data sets.

12. The method as claimed in claim 10 or 11, wherein, for each respective road, the road data set comprises:

length data indicative of a length of the respective road;

first road count data indicative of a first road count of incoming roads associated with nodes constituting the respective road;

second road count data indicative of a second road count of outgoing roads associated with the nodes;

percentage data indicative of a percentage of the incoming roads and the outgoing roads being roads for uni-directional traffic flow; and

probability data indicative of a probability of the respective road being a road for uni-directional traffic flow according to a road type of the respective road,

wherein the length, the first road count, the second road count, the percentage, and the probability are derived from the road network data.

13. The method as claimed in any one of claims 9 to 12, wherein, for applying the trained classifier model on the road data, the processing apparatus is configured to apply the trained classifier model on the road data to generate prediction data indicative of a predicted probability of the road being for uni-directional traffic flow or bi-directional traffic flow for predicting the direction of traffic flow on the road.

14. The method as claimed in any one of claims 9 to 13, further configured to, in response to a request from a user to access data associated with the road in the

defined geographical area, communicate the route navigation data to a device of the user for communicating the predicted direction of the traffic flow on the road to the user.

15. The method as claimed in any one of claims 9 to 14, further configured to process the route navigation data to generate at least one of visual information or audio information for communicating the predicted direction of the traffic flow on the road to the user.

16. The method as claimed in any one of claims 9 to 15, further configured to process the route navigation data and data indicative of a digital map representative of the defined geographical area for displaying the digital map with information corresponding to the predicted direction of the traffic flow on the road.

17. A method for training a classifier model, the method comprising:

generating training data based on road network data corresponding to a network of roads in a defined geographical area, and journey data sets, each journey data set comprising data indicative of a journey by a road user through the network of roads and being derived using geolocation transmissions from a communications device of the road user; and

training a classifier model based on the training data.

18. A method for generating route navigation data, the method comprising:

using a trained a classifier model based on road network data corresponding to a network of roads in a defined geographical area, and journey data sets, each journey data set comprising data indicative of a journey by a road user through the network of roads and being derived using geolocation transmissions from a communications device of the road user;

applying the trained classifier model on road data corresponding to a road in the defined geographical area, for the trained classifier model to predict a direction of traffic flow on the road; and

generating the route navigation data indicative of the predicted direction of the traffic flow on the road.

19. A computer program or a computer program product comprising instructions for implementing the method as claimed in any one of claims 9 to 18.

20. A non-transitory storage medium storing instructions, which when executed by a processor cause the processor to perform the method as claimed in any one of claims 9 to 18.

21. A processing apparatus for training a classifier model, comprising a processor and a memory, the apparatus being configured, under control of the processor to execute instructions in the memory to:

generate training data based on road network data corresponding to a network of roads in a defined geographical area, and journey data sets, each journey data set comprising data indicative of a journey by a road user through the network of roads and being derived using geolocation transmissions from a communications device of the road user; and

train a classifier model based on the training data.

22. A processing apparatus for generating route navigation data, comprising a processor and a memory, the apparatus being configured, under control of the processor to execute instructions in the memory to:

use a trained classifier model based on road network data corresponding to a network of roads in a defined geographical area, and journey data sets, each journey data set comprising data indicative of a journey by a road user through the network

of roads and being derived using geolocation transmissions from a communications device of the road user;

apply the trained classifier model on road data corresponding to a road in the defined geographical area, for the trained classifier model to predict a direction of traffic flow on the road; and

generate the route navigation data indicative of the predicted direction of the traffic flow on the road.