F O R M 2
THE PATENTS ACT, 1970
(39 of 1970)
&
THE PATENTS RULES, 2003
~~PROVISIONAL~~/COMPLETE SPECIFICATION
(*See* section 10 and rule 13)

1.TITLE OF THE INVENTION

Deep Convolution Neural Network Model for IoT Based Adaptive Traffic Control System

2. APPLICANT(S)

	Name	Nationality	**ADDRESS OF RESIDENCE**
1	Dr.S.Balamurugan	INDIAN	No.21, Kalloori Nagar, Peelamedu, Coimbatore-641004, Tamilnadu, India
2	Dr.K.Suganthi	INDIAN	Assistant Professor, Department of ECE, SRM Institute of Science and Technology, Kattankulathur, Chennai-603203, Tamilnadu, India
3	Dr.V.Sarada	INDIAN	Assistant Professor, Department of ECE, SRM Institute of Science and Technology, Kattankulathur, Chennai-603203, Tamilnadu, India
4	Dr.E.Chitra	INDIAN	Assistant Professor, Department of ECE, SRM Institute of Science and Technology, Kattankulathur, Chennai-603203, Tamilnadu, India
5	Dr.P.Radhika	INDIAN	Assistant Professor, Department of ECE, SRM Institute of Science and Technology, Kattankulathur, Chennai-603203, Tamilnadu, India

3. PREAMBLE TO THE DESCRITION
COMPLETE

The following specification particularly describes the invention and the manner in which it is to be performed.

4. Description:

Field of Invention:

With the rapidly growing urban population in the cities, the need for personalized transportation and vehicles have also increased rapidly. Research studies show that nearly 68% of the entire world population will be living in cities by the year 2050. Increase in traffic also leads to other environmental issues such as air pollution and noise pollution. It becomes vividly essential to regulate the traffic signals so as to reduce the air pollution and to reduce the possibilities for accidents. Proposed is a Deep Convolution Neural Network Model for IoT Based Adaptive Traffic Control System. Surveillance Cameras and IoT Sensors capture the length of vehicles waiting in the traffic jam. Data Gathering and Preprocessing is carried out in the application layer. Preprocessed data is subject to Reinforcement Learning. Based on the state and rewards of environment, appropriate actions are triggered by the agent. Convolutional Neural Networks Model is applied for the Training and Normalization. Long-Short Term Memory (LSTM) layer of the Deep Neural Networks keep the hidden states brief. Secure Event Traffic-Related Event Detection Mechanisms detects possible congestion using microcontroller communication.

Background Art & Description:

US20210397185A1 Systems and methods for predicting object motion and controlling autonomous vehicles are provided. In one example embodiment, a computer implemented method includes obtaining state data indicative of at least a current or a past state of an object that is within a surrounding environment of an autonomous vehicle. The method includes obtaining data associated with a geographic area in which the object is located. The method includes generating a combined data set associated with the object based at least in part on a fusion of the state data and the data associated with the geographic area in which the object is located. The method includes obtaining data indicative of a machine-learned model. The method includes inputting the combined data set into the machine-learned model. The method includes receiving an output from the machine-learned model. The output can be indicative of a plurality of predicted trajectories of the object.

US11302031B2 The present disclosure relates to an indoor positioning method for operating an indoor positioning system and an indoor positioning apparatus by executing an artificial intelligence (AI) algorithm and/or a machine learning algorithm in a 5G environment connected for the Internet of Things. The indoor positioning method according to an embodiment of the present disclosure includes receiving map data and map information data of an indoor map in

response to a presence of the indoor map of an indoor space, acquiring an image of the indoor space at a device camera, comparing image information of the indoor map with the acquired image information of the indoor space based on the map data and the map information data of the indoor space, and performing indoor localizing of the indoor space based on a result of the comparing.

US11479894B2 Provided are a method and an apparatus for analyzing a vibration of a deep-learning based washing machine. In the method for analyzing a vibration of a deep-learning based washing machine according to an embodiment of the present invention, a washing tub of the washing machine includes a specific shape pattern, an artificial neural network model is learned from a video image obtained by photographing the shape pattern through a camera and a vibration value sensed through the vibration sensor, and thus, by using the artificial neural network model, it is possible to predict a vibration value of the washing machine using the camera of the washing machine even without a vibration sensor. According to the present invention, a smart washing machine without the vibration sensor such as 6-axis gyro sensor can be implemented. The AI device of the present invention can be associated with an unmanned aerial vehicle (UAV), a robot, an augmented reality (AR) device, a virtual reality (VR) device, and a device related to a 5G service.

CN108137052B The present invention relates to a driving control apparatus and a driving control method with which a personalized function learned according to the taste and habit of each driver can be safely updated based on the driving operation of the driver and the detection results of various sensors; and a program. The personalized function for each driver is obtained by learning based on the driving operation performed by the driver during manual driving and the detection results of various sensors provided in the vehicle body. An authentication simulation is performed using the obtained personalization function, and when security is confirmed, the function is updated to a new personalization function. By correcting the operation instruction obtained when performing automated driving based on the detection result using the personalization function, automated driving that reflects the taste and habit of the driver can be achieved, thereby enabling safe and comfortable automated driving. The present disclosure may be applied to an automobile that performs automatic driving.

KR102152237B1 A CCTV control method and system based on situation analysis are disclosed. According to the present invention, the CCTV control system based on situation analysis comprises: a first image analysis device; a second image analysis device; and an integrated control server. The first image analysis device controls the operation of a

camera based on first metadata, and the second image analysis device determines whether or not an event has occurred using at least one of the first metadata and second metadata. According to the present invention, since the control is based on a movement of an object and a change in a situation, it is possible to probably reduce false information in event detection.

US10656657B2 Systems and methods for predicting object motion and controlling autonomous vehicles are provided. In one example embodiment, a computer implemented method includes obtaining state data indicative of at least a current or a past state of an object that is within a surrounding environment of an autonomous vehicle. The method includes obtaining data associated with a geographic area in which the object is located. The method includes generating a combined data set associated with the object based at least in part on a fusion of the state data and the data associated with the geographic area in which the object is located. The method includes obtaining data indicative of a machine-learned model. The method includes inputting the combined data set into the machine-learned model. The method includes receiving an output from the machine-learned model. The output can be indicative of a predicted trajectory of the object.

US20200019861A1 A method for controlling cooking based on artificial intelligence and an artificial intelligence device are disclosed. In the method for controlling cooking based on artificial intelligence, it is possible to continuously monitor how food ingredients are progressing by generating reference information including image information of completed dishes using food ingredient image information acquired through a monitoring unit provided in a kitchen appliance (for example, oven) and determining the cooked state of the food ingredients based on the reference information. An artificial intelligence device according to the present disclosure may be linked with an artificial intelligence module, a drone (unmanned aerial vehicle (UAV)), a robot, an augmented reality (AR) device, a virtual reality (VR) device, devices related to 5G services, and the like.

US20200027019A1 A method for training a model for creating POI data on a terminal through federated learning is disclosed. The method for training a model for creating POI data on a terminal through federated learning includes: receiving an SMS (short message service) message for notifying that a user of the terminal has made a payment; feeding the SMS message into a store information extraction model and acquiring store information from an output of the store information extraction model; acquiring current location information of the terminal; caching POI (point of interest) data, which is the location information labeled with the stored information; and training a first common prediction model using the POI data, wherein the first

common prediction model is received through a server, and the SMS message contains text information indicating the business name of the store where the user has made the payment. The terminal of the present disclosure can be associated with artificial intelligence modules, drones (unmanned aerial vehicles (UAVs)), robots, augmented reality (AR) devices, virtual reality (VR) devices, devices related to 5G service, etc.

US11622390B2 A method and apparatus for determining whether to perform transmission on a random access or a configured grant in wireless communication system is provided. The wireless device leaves a connected state with a network. The wireless device determines whether to perform transmission on a random access (RA) or a configured grant based on data available for transmission, wherein the configured grant is received from the network. The wireless device performs the transmission of the data based on the determination.

US11592570B2 A system and method for using high-end perception sensors such as high-end LIDARs to automatically label sensor data of low-end LIDARs of autonomous driving vehicles is disclosed. A perception system operating with a high-end LIDAR may process sensed data from the high-end LIDAR to detect objects and generate metadata of objects surrounding the vehicle. The confidence level of correctly identifying the objects using the high-end LIDAR may be further enhanced by fusing the data from the high-end LIDAR with data from other sensors such as cameras and radars. The method may use the detected objects and metadata of the detected objects processed from the data captured by the high-end LIDAR and other sensors as ground truth to label data of a same scene captured by a low-end LIDAR mounted on the vehicle. A neural network may use the labeled sensor data from the low-end LIDAR during offline supervised training.

US20200216064A1 Among other things, systems and methods for classifying perceived objects based on activity are disclosed. The systems and methods can include means for receiving sensor information corresponding to at least one object and determining an activity prediction for the at least one object in accordance with the sensor information. The system and methods can include means for classifying the object in accordance with the activity prediction. A controller circuit can operate control functions of a vehicle at least partially based on the classification of the at least one object.

KR20190091419A According to the present invention, a control method for an autonomous vehicle comprises the following steps of: generating driving information by combining meta information including location information and image information; receiving an object detection

algorithm selected based on the meta information; setting a driving route based on the object detection algorithm while monitoring a main object having a history of appearance at a place indicated by the location information; and resetting the driving route to avoid an dangerous object when dangerous object information is provided from a server. According to the present invention, at least one of an autonomous vehicle, a user terminal, and a server may be connected to a device associated with an artificial intelligence module, an unmanned aerial vehicle (UAV), a robot, an augmented reality (AR) device, a virtual reality (VR) device, and a 5G service.

US11037548B2 A method for training an artificial neural network-based speech recognition model is disclosed. In the method for training an artificial neural network-based speech recognition model, a user's speech is learned by using target data representing features and non-target data representing non-features as random inputs and outputs, and then the user's speech is recognized under a noise situation. A method for training an artificial neural network-based speech recognition model and speech recognition device of the present disclosure can be associated with artificial intelligence modules, drones (unmanned aerial vehicles (UAVs)), robots, augmented reality (AR) devices, virtual reality (VR) devices, devices related to 5G service, etc.

With the rapidly growing urban population in the cities, the need for personalized transportation and vehicles have also increased rapidly. Research studies show that nearly 68% of the entire world population will be living in cities by the year 2050. Increase in traffic also leads to other environmental issues such as air pollution and noise pollution. It becomes vividly essential to regulate the traffic signals so as to reduce the air pollution and to reduce the possibilities for accidents. Proposed is a Deep Convolution Neural Network Model for IoT Based Adaptive Traffic Control System. Surveillance Cameras and IoT Sensors capture the length of vehicles waiting in the traffic jam. Data Gathering and Preprocessing is carried out in the application layer. Preprocessed data is subject to Reinforcement Learning. Based on the state and rewards of environment, appropriate actions are triggered by the agent. Convolutional Neural Networks Model is applied for the Training and Normalization. Long-Short Term Memory (LSTM) layer of the Deep Neural Networks keep the hidden states brief. Secure Event Traffic-Related Event Detection Mechanisms detects possible congestion using microcontroller communication.

Claims:

In this invention on Deep Convolution Neural Network Model for IoT Based Adaptive Traffic Control System, we claim that

1. Surveillance Cameras and IoT Sensors capture the length of vehicles waiting in the traffic jam. Data Gathering and Preprocessing is carried out in the application layer. Preprocessed data is subject to Reinforcement Learning.
2. **As a system in Claim 1,** Based on the state and rewards of environment, appropriate actions are triggered by the agent. Convolutional Neural Networks Model is applied for the Training and Normalization.
3. **As a system in Claim** 2**,** Long-Short Term Memory (LSTM) layer of the Deep Neural Networks keep the hidden states brief. Secure Event Traffic-Related Event Detection Mechanisms detects possible congestion using microcontroller communication.

Description of Drawings:

For the detailed understanding of the invention the explanations with reference to the figures are given below.

Figure 1: represents the block diagram of the proposed system

Figure 2: represents a working of the proposed system

5. Claims:

In this invention on **Deep Convolution Neural Network Model for IoT Based Adaptive Traffic Control System**, we claim that

1. Surveillance Cameras and IoT Sensors capture the length of vehicles waiting in the traffic jam. Data Gathering and Preprocessing is carried out in the application layer. Preprocessed data is subject to Reinforcement Learning.
2. As a system in Claim 1, Based on the state and rewards of environment, appropriate actions are triggered by the agent. Convolutional Neural Networks Model is applied for the Training and Normalization.
3. As a system in Claim 2, Long-Short Term Memory (LSTM) layer of the Deep Neural Networks keep the hidden states brief. Secure Event Traffic-Related Event Detection Mechanisms detects possible congestion using microcontroller communication.

Dated this……. day of……. 2023

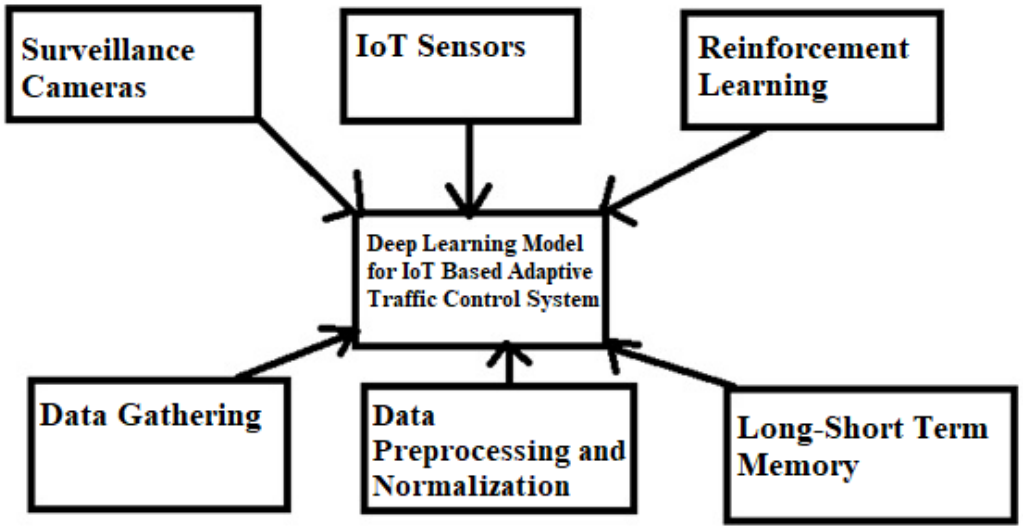
1.Signature :- 2.Signature :- 3.Signature:-

Name: Dr.S.Balamurugan Name: Dr.K.Suganthi Name : Dr.V.Sarada

4.Signature :- 5.Signature :

Name: Dr.E.Chitra Name : Dr.P.Radhika

Figure 1:



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4.Signature :- 5.Signature :

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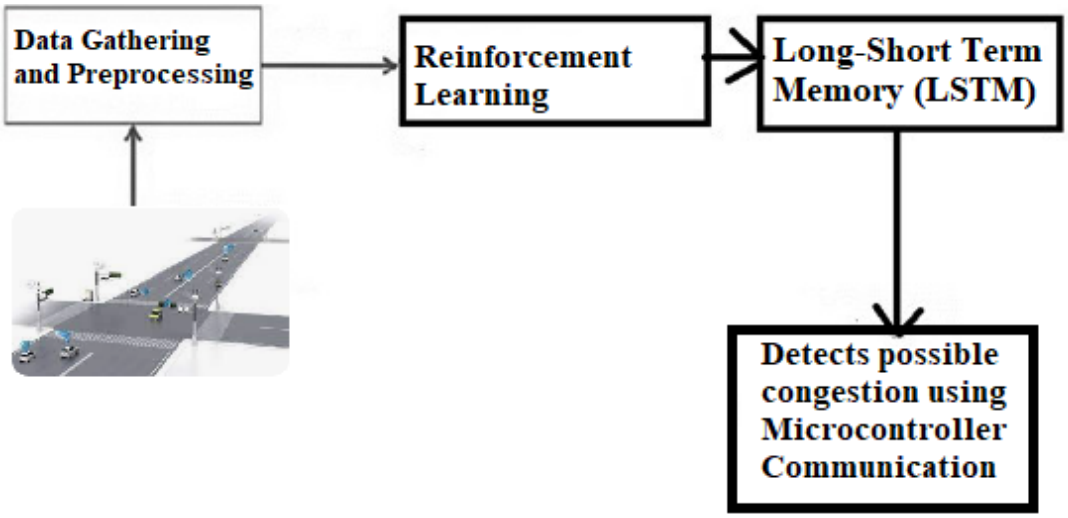
Figure 2:



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07. Abstract:

With the rapidly growing urban population in the cities, the need for personalized transportation and vehicles have also increased rapidly. Research studies show that nearly 68% of the entire world population will be living in cities by the year 2050. Increase in traffic also leads to other environmental issues such as air pollution and noise pollution. It becomes vividly essential to regulate the traffic signals so as to reduce the air pollution and to reduce the possibilities for accidents. Proposed is a Deep Convolution Neural Network Model for IoT Based Adaptive Traffic Control System. Surveillance Cameras and IoT Sensors capture the length of vehicles waiting in the traffic jam. Data Gathering and Preprocessing is carried out in the application layer. Preprocessed data is subject to Reinforcement Learning. Based on the state and rewards of environment, appropriate actions are triggered by the agent. Convolutional Neural Networks Model is applied for the Training and Normalization. Long-Short Term Memory (LSTM) layer of the Deep Neural Networks keep the hidden states brief. Secure Event Traffic-Related Event Detection Mechanisms detects possible congestion using microcontroller communication.

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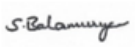
1.Signature :- 	2.Signature :- 	3.Signature:- 
Name: Dr.S.Balamurugan	Name: Dr.K.Suganthi	Name : Dr.V.Sarada
4.Signature :- 	5.Signature : 	
Name: Dr.E.Chitra	Name : Dr.P.Radhika	