

Design of Expressway Advertising System

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Abstract

An accurate advertising delivery system relates to the field of advertising marketing technology. The system includes a gantry (1), an incoming vehicle feature recognition module for identifying the license plate and vehicle type information of the coming vehicle, an advertising angle adjustment module, an advertising broadcast module for accurate advertising, a central control module (10) and a communication module (20). The two legs of the gantry (1) are fixed on both sides of the expressway. The advertising angle adjustment module includes a rotating motor (21), a pair of bearing seats (22), a pair of rotating shafts (23) and a box (5). The rotating motor (21) and bearing seats (22) are respectively fixed and installed on the top of the gantry (1). The design is simple in structure, low in manufacturing cost, diversified in advertising display, and accurate in advertising delivery according to the characteristics of the cars coming from the front. The advertising effect is better and more obvious. The angle of the advertising broadcast module can be adjusted in real time according to the direct light intensity, so that passengers in the high-speed vehicles can watch the advertisements more clearly and comfortably.

Keywords

Expressway, Advertisement, Delivery System.

1. Preface

In recent years, with the change of China's media market environment and the impact of Internet advertising, high-speed advertising, as a part of outdoor advertising, is often ignored by the market and industry. However, with the gradual improvement of China's highway network and the continuous growth of mileage, the highway advertising industry has ushered in a certain space for development. Compared with other advertising media, Highway advertising has incomparable advantages over other advertising media.

The expressway is known as the "golden channel". As the pride of modern transportation, it is the representative of speed and efficiency, and also one of the important signs to measure the modernization of the national economy. By 2019, the national highway mileage has reached 149600 kilometers, an increase of 7000 kilometers over the previous year. It is expected that the national highway mileage will reach 150000 kilometers in 2020. In 2019, the traffic volume of passenger cars on national highways totaled 7.814 billion, up 8.3% year on year. In the face of such a huge market demand and audience groups, advertising forms generated around the highway usher in development space.

However, at present, the advertising of expressway is always in the mode of flooding. It is directly set in the key positions such as the turnoff or toll station of the expressway with brackets. In the face of coming vehicles, the advertising will not change. Such advertising mode of expressway advertising is often not ideal, and can not be targeted to accurately push the advertising of coming vehicles. At the same time, in the highway advertising scene, because the billboard is set at a high position, if the passengers are interested in the advertising content,

they need to look up high to watch the ads, which will pose a driving risk. Under some morning light or sunset, the ads will not be clearly displayed.

The relevant existing technologies in the above have the following defects: the existing highway advertising delivery mode cannot meet the needs of businesses for accurate advertising delivery, and its advertising effect is greatly discounted. At the same time, there will be light impact on the broadcast effect when advertising delivery.

2. Design content

In order to improve the existing highway advertising delivery mode in the existing technology, which can not meet the needs of businesses for accurate advertising delivery, the advertising effect is greatly discounted, and there will be a problem that lighting affects the broadcast effect when advertising delivery, the application provides a precise advertising delivery system. The following technical solutions are adopted:

An accurate advertising delivery system includes a gantry, an incoming vehicle feature recognition module for identifying the license plate and vehicle type information of the coming vehicle, an advertising angle adjustment module, an advertising broadcast module for accurate advertising, a central control module and a communication module. The two legs of the gantry are fixed on both sides of the expressway, and the advertising angle adjustment module includes a rotating motor, a pair of bearing seats, a pair of rotating shafts and a box. The rotating motor and the bearing seat are respectively fixed and installed on the top of the gantry. One end of the pair of rotating shafts is respectively fixed and installed on both sides of the box, and the other end is installed in the bearing seat and connected with the power output shaft of the rotating motor. The advertising broadcast module is fixed and installed on the box. The coming vehicle feature recognition module and the advertisement playing module are communicated and interconnected with the central control module through the communication module respectively.

By adopting the above technical scheme, the incoming vehicle feature recognition module recognizes the relevant information of the coming vehicle and transmits it to the central control module, which selectively controls the advertising corresponding to the display content of the advertising broadcast module to the passengers in the corresponding vehicle according to the incoming vehicle information, so as to achieve accurate advertising push. The rotating motor drives the box to rotate through the shaft. Thus, the advertisement playing module is driven to rotate, so that passengers can view advertisements without raising their heads at a higher angle. The feature recognition module for approaching vehicles includes a vehicle feature recognition unit and a speed detector. The vehicle feature recognition unit includes a front facing camera group and a vehicle image processor. The front facing camera group is detachably mounted on one side of the expressway through a bracket and is more than meters away from the gantry, and is located on the side of the gantry in the direction of approaching vehicles. The camera of the front facing camera group faces the direction of approaching vehicles. The vehicle image processor is communicated with the front camera group, processes and recognizes the vehicle image transmitted from the front camera group, completes the recognition of vehicle features, and transmits the recognition results to the central control module in real time through the communication module. The speed detector is set on the housing of the front camera group, facing the direction of coming vehicles, and transmits the speed measurement results to the central control module in real time.

By adopting the above technical scheme, the front camera set is set at the place where the coming direction of the gantry is greater than, to read the feature information of the coming car that is about to enter the advertising broadcast module in advance, to roughly judge the characteristics of the passengers in the coming car from the car model, such as the car image

processor to judge that the coming car in front is a bus, so that the central control module can according to the preset corresponding advertising scheme, And according to the speed measured by the speedometer, control the advertising broadcast module to play the corresponding advertising video at the corresponding time, so as to achieve accurate advertising.

The advertising broadcast module includes a box body, an advertising display screen and an advertising roller shutter. The box body is fixed on the crossbeam of the gantry and faces the side of the incoming vehicle. The advertising display screen is fixed on one side of the box body, and the advertising roller shutter is installed on the other side of the box body.

By adopting the above technical scheme, the advertising display screen displays advertising videos, and the advertising roller shutter displays advertising inkjet images. The two forms of advertising are arranged on both sides of the box, which makes advertising more diversified.

The central control module includes a central processor, an advertising memory, an illumination sensor and a motor controller. The central processor receives the vehicle characteristics and vehicle speed information from the vehicle image processor and the speedometer, and controls the advertising display screen to read the relevant contents of the advertising memory for playing. The illumination sensor is installed on the box and is located at one side of the advertising display screen, The central control module receives the real-time light intensity measurement data from the illuminance sensor, and the central processor controls the start and stop of the advertising roller shutter motor and the rotating motor respectively through the motor controller.

By adopting the above technical scheme, the central processor controls the advertising display screen to read the relevant content of the advertising memory at the corresponding time and play the corresponding advertising video according to the vehicle characteristics and vehicle speed information transmitted from the vehicle image processor and the speedometer, according to the preset corresponding advertising scheme, so as to achieve accurate advertising. The central processor, according to the set scheme, The start and stop of the advertising roller shutter motor is controlled by the motor controller on a regular basis to achieve the function of changing the advertising inkjet image at the set time. The illumination sensor monitors the light intensity on the whole advertising display screen in real time and transmits it to the central processor in real time. When the light intensity exceeds the set threshold, The central processor controls the rotation motor to start the rotation setting angle through the motor controller, which is more convenient for passengers to see the broadcast content of the advertising display screen.

Vehicle image processor is a vehicle image processor based on DSP chip.

By adopting the above technical scheme, the vehicle image processor based on DSP chip can realize the recognition of the vehicle type and the vehicle location of the coming vehicle.

The box is a rectangular frame structure composed of aluminum alloy profiles.

By adopting the above technical scheme, the rectangular frame structure composed of aluminum alloy profiles is easy to manufacture, low in cost and high in strength.

The communication module is a wireless communication module or switch.

By adopting the above technical scheme, the wireless communication module or switch can realize the communication interconnection between the feature recognition module and the advertisement broadcast module of the coming vehicle and the central control module.

3. Implementation mode

An accurate advertising delivery system includes a gantry, an incoming vehicle feature recognition module for identifying the license plate and vehicle type information of the coming

vehicle, an advertising angle adjustment module, an advertising broadcast module for accurate advertising, a central control module and a communication module. The two legs of the gantry are fixed on both sides of the expressway, and the advertising angle adjustment module includes a rotating motor. A pair of bearing seats, a pair of rotating shafts and a box. The rotating motor and the bearing seat are respectively fixed and installed on the top of the gantry. One end of the pair of rotating shafts is respectively fixed and installed on both sides of the box, and the other end is installed in the bearing seat and connected with the power output shaft of the rotating motor. The advertising broadcast module is fixed and installed on the box. The coming vehicle feature recognition module and the advertisement playing module are communicated and interconnected with the central control module through the communication module respectively.

The coming car feature recognition module recognizes the relevant information of the coming car in front and transmits it to the central control module. The central control module selectively controls the advertisement corresponding to the display content of the advertisement broadcast module to the passengers in the corresponding vehicle according to the coming car information, so as to achieve accurate advertisement push. The rotating motor drives the box to rotate through the rotating shaft, thus driving the advertisement broadcast module to rotate. It enables passengers to watch advertisements without raising their heads at a higher angle.

The feature recognition module for approaching vehicles includes a vehicle feature recognition unit and a speedometer. The vehicle feature recognition unit includes a front camera group and a vehicle image processor. The front camera group is detachably mounted on one side of the expressway with a distance of more than meters from the gantry and is located on the side of the gantry in the direction of approaching vehicles. The vehicle image processor communicates with the front camera group, processes and recognizes the vehicle image transmitted from the front camera group, completes the recognition of vehicle characteristics, and transmits the recognition results to the central control module in real time through the communication module. The speedometer is set on the front camera group housing, facing the direction of incoming vehicles, and transmits the speed measurement results to the central control module in real time.

The front camera set is set at the place where the approaching direction of the gantry is greater than. It reads the feature information of the coming car that is about to enter the advertising broadcast module in advance, and roughly judges the characteristics of the passengers in the coming car from the car model. For example, the vehicle image processor judges that the coming car in front is a bus, so that the central control module can according to the preset corresponding advertising scheme. And according to the speed measured by the speedometer, control the advertising broadcast module to play the corresponding advertising video at the corresponding time, so as to achieve accurate advertising.

The advertising broadcast module includes an advertising display screen and an advertising roller shutter. The advertising display screen is fixed on one side of the box and faces the direction of the coming car. The advertising roller shutter is installed on the other side of the box.

The advertising display screen displays advertising videos, and the advertising roller shutter displays advertising inkjet images. The two forms of advertising are arranged on both sides of the box, which makes advertising more diversified.

The central control module includes the central processor, advertising memory, illumination sensor and motor controller. The central processor receives the vehicle characteristics and vehicle speed information from the vehicle image processor and the speedometer, and controls the advertising display screen to read the relevant contents of the advertising memory for

playing. The illumination sensor is installed on the box and located at the side of the advertising display screen, The central control module receives the real-time light intensity measurement data from the illuminance sensor, and the central processor controls the start and stop of the advertising roller shutter motor and the rotating motor respectively through the motor controller.

The central processor controls the advertising display screen to read the relevant content of the advertising memory at the corresponding time and play the corresponding advertising video according to the vehicle characteristics and vehicle speed information transmitted from the vehicle image processor and the speedometer, according to the preset corresponding advertising scheme, so as to achieve accurate advertising delivery, The start and stop of the advertising roller shutter motor is controlled by the motor controller on a regular basis to achieve the function of changing the advertising inkjet image at the set time. The illumination sensor monitors the light intensity on the whole advertising display screen in real time and transmits it to the central processor in real time. When the light intensity exceeds the set threshold, The central processor controls the rotation motor to start the rotation setting angle through the motor controller, which is more convenient for passengers to see the broadcast content of the advertising display screen.

Vehicle image processor is a vehicle image processor based on DSP chip.

The vehicle image processor based on DSP chip can recognize the vehicle type and vehicle location of the coming vehicle.

The box is a rectangular frame structure composed of aluminum alloy profiles.

The rectangular frame structure composed of aluminum alloy profiles is easy to manufacture, low in cost and high in strength.

The communication module is a wireless communication module or switch.

The line communication module or switch can realize the communication interconnection between the coming vehicle feature recognition module and the advertisement broadcast module and the central control module.

The implementation principle of an accurate advertising delivery system in the embodiment of the application is:

When the system is running, the front camera set is set at the place where the direction of the gantry is greater than, to read the feature information of the coming car that is about to enter the advertising broadcast module in advance. The vehicle image processor based on DSP chip can identify the model of the coming car and the location of the vehicle, including identifying the vehicle model information: buses, private cars from other places or trucks, Generally judge the characteristics of the passengers coming in from the vehicle model.

For example, the vehicle image processor judges that the coming car is a bus, so the central control module can control and control the advertising display screen to play the corresponding tourism or hotel advertising videos at the corresponding time according to the preset corresponding advertising scheme and the speed measured by the speedometer, so as to achieve accurate advertising, The motor controller controls the start and stop of the advertising roller shutter motor at regular intervals to achieve the function of changing the advertising inkjet image regularly according to the set time. The advertising roller shutter is located on the back of the coming car, which makes the advertising for the coming car in the reverse lane more diversified, and the illumination sensor monitors the light intensity on the whole advertising display screen in real time, And it is transmitted to the central processing unit in real time. When the light intensity exceeds the set threshold, the central processing unit controls the rotation motor to start the rotation setting angle through the motor controller, which is more convenient for passengers to see the broadcast content of the advertising display screen.

4. Conclusion

- 1) This design can provide an accurate advertising delivery system with simple structure, low manufacturing cost, diversified advertising display, and accurate advertising delivery based on the characteristics of the coming cars in front. The advertising effect is better and more obvious.
- 2) The angle of the advertising broadcast module can be adjusted in real time according to the direct light intensity, so that passengers in the high-speed vehicles can watch the advertisements more clearly and comfortably.

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