

METHOD FOR INTEGRATING VITAL SIGNS MONITORING WITH VEHICLE CONTROL

FIELD OF THE DISCLOSURE

The present disclosure relates generally to a method for vital signs monitoring, and particularly to a method for integrating vital signs monitoring with vehicle control.

BACKGROUND OF THE DISCLOSURE

The Taiwan Patent Number I565611 entitled “Driving Safety Detecting Method, System, In-Vehicle Computer and Intelligent Wearable Device” discloses a driving safety detecting system. According to some embodiments of the disclosure, the system comprises an in-vehicle computer of a vehicle and an intelligent wearable device worn by a user. The in-vehicle computer and the intelligent wearable device operate in coordination to execute the driving safety detecting method. As the judgement result depicts that the user is in the condition not suitable for driving, one or more of the following actions will be executed. The actions include launching alarms, pausing transmitting the start signal for the vehicle, stopping compulsorily transmitting the start signal for the vehicle, enabling the in-vehicle computer to launch alarms, enabling the in-vehicle computer to pause vehicle start, and enabling the in-vehicle computer to stop compulsorily vehicle start.

The Taiwan Patent Number I579804 entitled “Judgement System for Driver Heart Attack” adopts a plurality of sensing devices to extract the physiological signals including heart rate, blood pressure, and respiration frequency signals for detecting a driver’s physiological statuses and judging if a heart attack occurs. It is judged if the physiological signals including heart rate, blood pressure, and respiration frequency signals exceed threshold values. If one or more of the physiological signals exceed threshold values, the driver’s danger level is judged according to the number of the physiological signals exceeding threshold values and an alarm is launched if required.

The Taiwan Patent Number M532982 entitled “Belt Device with Measured Physiological and Vehicle Safety System Having Thereof” is able to detect a user’s

physiological statuses as soon as he fastens the safety belt. By integrating data via remote servers, the user can inspect his personal health history. In addition, by integrating long-term variations of personal physiological statuses with standard health samples, the user's physiological statuses can be judged more accurately. The user not only can understand his health condition by using the time of taking the transportation vehicles efficiently and conveniently but also can avoid accidents caused by bad physiological conditions. Alternatively, when applied to public transportation vehicles, the passengers can be identified. While emergency occurs, the user's physiological statuses can be understood rapidly, and appropriate interventions can be adopted accordingly.

Nowadays, automobile technologies are developing towards safety driving. Many major car manufacturers use high-tech electronic technologies to enhance the driving safety of their products. Consequently, the role of in-vehicle computers has become more important and their functions has increased. The reasons for modern traffic accidents are closely related to whether the driver is concentrated or not. For example, a drunk or fatigue driver's concentration is significantly affected. In particular, it is undoubtedly crucial for the safety of tens or even hundreds of passengers to ensure normality of the physiological condition of the drivers of public transportation systems.

Unfortunately, instead of activating the corresponding measures before starting driving, current detection mechanisms require an observation period after starting driving before a warning can be launched. For example, a driver tends to be unconscious of his fatigue level. His vigor is usually overestimated. Alternatively, due to long-distance driving, his spiritual condition can be reduced and attention unfocused. As a consequence, traffic accidents may occur. In comparison with drunk driving, fatigue driving is a more unavoidable traffic threat because it cannot be prevented by personal will. According to the current detection mechanism, whether a driver is fatigue cannot be judged unless the deviation of the driving trajectory or frequent eye closing can be observed for a period after starting driving. The current detection mechanisms are unable to complete judgement before car starting. Once judgement can be completed before car starting, car starting by the driver can be

prohibited and thus preventing accidents.

The present disclosure integrates a wearable device of vital signs monitoring with vehicle control for providing method for driver protection, emergency medical treatments, or special requirements and thus providing drivers with more safety mechanisms. In the future, the present system can be applied to passenger and logistics transportation. In addition to providing drivers with alarm information, smart management functions can be constructed. Thereby, a smart monitoring and controlling platform for drivers can be established.

When drivers' vital signs are abnormal, such as highly stimulated emotions or unconsciousness, and in danger, the vehicle control unit (VCU) will intervene the vehicle control for preventing improper parking on the roadside due to their bad conditions and for setting parking light signs.

SUMMARY

An objective of the present disclosure is to provide a method for integrating vital signs monitoring with vehicle control. When a driver encounters the dangerous situation of abnormal vital signs such as highly stimulated emotions or unconsciousness, the VCU will intervene vehicle control and monitor the driver's vital-sign signals including electrocardiogram, blood pressure, pulse rate, blood oxygen saturation, body temperature, and respiration waves. Then the corresponding warnings will be submitted according to the threshold values of the various vital-sign signals.

To achieve the above objective, according to an embodiment of the present disclosure, a method for integrating vital signs monitoring with vehicle control is disclosed and applicable to a VCU of a vehicle. The method comprises steps of: receiving two or more vital-sign signals generated by a sensing device; judging a driving status according to two or more threshold values and the two or more vital-sign signals, and judging a danger level of the driving status once the driving status is judged bad; and controlling the vehicle according to the danger level of the driving status.

According to an embodiment of the present disclosure, the sensing device is a

wearable sensing device that senses at least two of a driver's blood pressure, pulse rate, body temperature, respiratory rate, and blood oxygen saturation for generating the two or more vital-sign signals.

According to an embodiment of the present disclosure, the VCU integrates a motor control unit (MCU), a battery management system (BMS), an electric power steering control system, an electric cooling control system, an in-vehicle charger, and a direct-current (DC) voltage converter.

According to an embodiment of the present disclosure, in the step of judging the danger level of the driving status, the danger level of the driving status is judged according to the two or more threshold values of blood pressure, pulse rate, body temperature, respiratory rate, and blood oxygen saturation.

According to an embodiment of the present disclosure, in the step of judging the danger level of the driving status, the VCU judges the danger level of the driving status to be a first danger level once the blood pressure, the body temperature, and the blood oxygen saturation are between a first threshold value and a second threshold value thereof, respectively.

According to an embodiment of the present disclosure, in the step of controlling the vehicle according the danger level of the driving status, the VCU outputs a reminding signal to a human-machine interface unit.

According to an embodiment of the present disclosure, in the step of judging the danger level of the driving status, the VCU judges the danger level of the driving status to be a second danger level once the blood pressure and the blood oxygen saturation are between a second threshold value and a third threshold value thereof, respectively.

According to an embodiment of the present disclosure, in the step of controlling the vehicle according the danger level of the driving status, the VCU outputs an alarm signal to a human-machine interface unit.

According to an embodiment of the present disclosure, in the step of judging the danger level of the driving status, the VCU judges the danger level of the driving status to be a third danger level once the blood pressure, the pulse rate, the body temperature, the respiratory rate, and the blood oxygen saturation exceed a third

threshold value thereof, respectively.

According to an embodiment of the present disclosure, in the step of controlling the vehicle according the danger level of the driving status, the VCU controls the vehicle to maintain a safe distance from the front vehicle and display light signals.

According to an embodiment of the present disclosure, in the step of controlling the vehicle according the danger level of the driving status, the VCU further triggers a communication device to transmit an emergency notification signal to a first-aid unit.

To sum up, when drivers' vital signs are abnormal, such as highly stimulated emotions or unconsciousness, and in danger, the VCU will intervene the vehicle control for preventing drivers from parking incapably on the roadside due to their bad conditions and for setting parking light signs.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a system schematic diagram of the method for integrating vital signs monitoring with vehicle control according to an embodiment of the present disclosure;

FIG. 2 shows a flowchart of the method for integrating vital signs monitoring with vehicle control according to an embodiment of the present disclosure;

FIG. 3 shows a flowchart of judging bad condition according to an embodiment of the present disclosure;

FIG. 4A shows a flowchart of judging danger levels according to an embodiment of the present disclosure;

FIG. 4B shows a flowchart of judging the third danger level according to an embodiment of the present disclosure;

FIG. 4C shows a flowchart of the control mode of the third danger level according to an embodiment of the present disclosure;

FIG. 4D shows a flowchart of judging the second danger level according to an embodiment of the present disclosure;

FIG. 4E shows a flowchart of the control mode of the second danger level according to an embodiment of the present disclosure; and

FIG. 4F shows a flowchart of the control mode of the first danger level according to

an embodiment of the present disclosure

DETAILED DESCRIPTION

In order to make the process and characteristics as well as the effectiveness of the present disclosure to be further understood and recognized, the detailed description of the present disclosure is provided as follows along with embodiments and accompanying figures.

In the subsequent description, figures are used for illustrating various embodiments of the present disclosure. Nonetheless, the concepts of the present disclosure can be embodied by many different forms. The described embodiments should not be interpreted for limiting the present disclosure.

First, please refer to FIG. 1 and FIG. 2, which show schematic diagrams for the system and the steps according to an embodiment of the present disclosure. As shown in Figures 1 and 2, the present disclosure provides a method for integrating vital signs monitoring with vehicle control applicable to a VCU 14 of a vehicle 10. In addition, the vehicle 10 includes a sensing device 12, an electric control unit 16, a car microcontroller 18, an advanced driving assistance unit 20, an anti-lock braking system unit 22, an electric power steering unit 24, and a human-machine interface unit 26. According to the electric control unit 16, the car microcontroller 18, the advanced driving assistance unit 20, the anti-lock braking system unit 22, the electric power steering unit 24, and the human-machine interface unit 26 connected with the VCU 14, the VCU 14 integrates an MCU, a BMS, an electric power steering control system, an electric cooling control system, an in-vehicle charger, and a DC voltage converter. As shown in FIG. 2, the method according to the present disclosure uses the vital-sign signals of a driver (not shown in the figures) of the vehicle 10 sensed by the sensing device 12 to enable the VCU 14 to judge how to drive the connected control units (such as, the electric control unit 16, the car microcontroller 18, the advanced driving assistance unit 20, the anti-lock braking system unit 22, the electric power steering unit 24, the human-machine interface unit 26) according to the driver's driving status. The method comprises the following steps:

Step S100: Receiving the sensing signal;
Step S110: Judging if the driving status is bad;
Step S120: Judging the danger level of the driving status; and
Step S140: Controlling the vehicle according to the danger level of the driving status.

As shown in the step S100, the VCU 14 receives two or more vital-sign signals, for example, two or more of blood pressure, pulse rate, body temperature, respiratory rate, and blood oxygen saturation, sensed by the sensing device 12. The sensing device 12 according to the present embodiment senses the values of blood pressure, pulse rate, body temperature, respiratory rate, and blood oxygen saturation. Nonetheless, the present disclosure is not limited to the embodiment. Two or more vital-sign signals can be extracted depending on requirements. Besides, the sensing device 12 can be a wearable sensing device. As shown in the step S110, the VCU 14 judges if the driving status is bad according to the two or more vital-sign signals and the first threshold value corresponding to the two or more vital-sign signals, respectively. For example, the two or more vital-sign signals include the blood pressure, the body temperature, and the blood oxygen saturation. Whether the driving status is bad is judged according to whether the blood pressure, the body temperature, and the blood oxygen saturation exceed the first threshold value thereof, respectively. Once the blood pressure, the body temperature, and the blood oxygen saturation exceed the first threshold value thereof, respectively, the driving status is judged to be bad. If the blood pressure, the body temperature, and the blood oxygen saturation do not exceed the first threshold value thereof, respectively, the driving status is judged to be normal, and the process is returned to the step S100. Next, as shown in the step S120, the VCU 14 judges the danger level of the driving status according to at least a second threshold value of the two or more vital-sign signals, respectively. As shown in the step S140, the VCU 14 executes the corresponding controls according to the danger level of the driving status judged from the step S120.

As shown in FIG. 3, whether the driving status is bad is judged. The steps comprise:

Step S100: receiving the sensing signal;

Step S110a: Body temperature < Threshold value B1;

Step S110b: Blood pressure < Threshold value C1;

Step S110c: Blood oxygen saturation < Threshold value E1;

Step S110d: Accumulating times;

Step S110e: Accumulated times > Threshold value; and

Step S120: Judging the danger level of the driving status.

From step S110a to step S110c, judging the driving status, such as the body temperature, the blood pressure, and the blood oxygen saturation according to the first threshold values B1, C1, E1. The first threshold values B1, C1, E1 of the body temperature, the blood pressure, and the blood oxygen saturation according to the present embodiment are 34 °C or 38 °C, 90 mmHg or 135 mmHg, and 90%, respectively. Each of the judgements from step S110a to step S110c is established to accumulate a judgement time. The step S120 is executed until the accumulation times reaching the times threshold. In practices, the times threshold often is 3. It means the judgements from step S110a to step S110c are all established once. In other words, when the body temperature is lower than 34 °C or higher than 38 °C, the diastolic blood pressure is lower than 90 mmHg or the systolic blood pressure is higher than 135 mmHg, and the blood oxygen saturation is lower than 90%, in once judgement, the step S120 is executed for judging the danger level of the driving status. Else, return to step S100.

FIG. 4A shows the method for judging the danger level of the driving status and comprising the steps S122 through S132 as below:

Step S122: Start judging;

Step S124: Judging if the pulse rate, the body temperature, the blood pressure, the respiratory rate, and the blood oxygen saturation exceed a third threshold value thereof A3, B3, C3, D3, E3, respectively;

Step S126: The third danger level;

Step S128: Judging if the blood pressure and the blood oxygen saturation exceed a

second threshold value thereof, respectively;

Step S130: The second danger level; and

Step S132: The first danger level.

As shown in FIG. 4A, according to an embodiment, the two or more vital-sign signals are chosen to be the blood pressure, the body temperature, and the blood oxygen saturation. As shown in the step S122, the VCU 14 enters the mode of judging the danger level because the blood pressure, the body temperature, and the blood oxygen saturation all exceed the first threshold value thereof, respectively. As shown in the step S124, the VCU 14 judges if the blood pressure, the pulse rate, the body temperature, the respiratory rate, and the blood oxygen saturation exceed the third threshold value thereof, respectively. If so, the step S126 is executed; if not, the step S128 is executed. As shown in the step S126, according to the fact that the blood pressure, the pulse rate, the body temperature, the respiratory rate, and the blood oxygen saturation all exceed the third threshold value thereof, respectively, the VCU 14 judges the danger level of the driving status to be a third danger level.

As shown in the step S128, the VCU 14 judges if the blood pressure, the body temperature, and the blood oxygen saturation exceed the second threshold value thereof, respectively. As shown in the step S130, the VCU 14 next judges the danger level of the driving status to be a second danger level according to the fact that the blood pressure, the body temperature, and the blood oxygen saturation are located between the second and the third threshold value thereof, respectively. When the blood pressure, the body temperature, and the blood oxygen saturation do not exceed the second threshold value thereof, respectively and are between the first and second threshold value thereof, respectively, the step S132 is executed, in which the VCU 14 judges the danger level of the driving status to be a first danger level.

FIG. 4B shows the method for judging the third danger level and comprising the steps S124a through S128. In the following steps, whether the pulse rate, the body temperature, the blood pressure, the respiratory rate, and the blood oxygen saturation exceed the third threshold value thereof, respectively, are judged in order:

Step S124a: Pulse rate < Threshold value A3;
 Step S124b: Body temperature < Threshold value B3;
 Step S124c: Blood pressure < Threshold value C3;
 Step S124d: Respiratory rate < Threshold value D3;
 Step S124e: Blood oxygen saturation < Threshold value E3;
 Step S124f: Accumulating times;
 Step S124g: Accumulated times > Threshold value;
 Step S126: Judging the danger level to be the third danger level; and
 Step S128: Judging if the blood pressure and the blood oxygen saturation exceed the second threshold value.

According to the present embodiment, the third threshold values A3, B3, C3, D3, E3 of the pulse rate, the body temperature, the blood pressure, the respiratory rate, and the blood oxygen saturation are 40 or 120 times per minute, 30 or 42 °C, 50 mmHg for the diastolic blood pressure or 150 mmHg for diastolic blood pressure, 10 times per minute, and 80%, respectively. In other words, when the pulse rate is lower than 40 times or higher than 120 times per minute, the body temperature is lower than 30 °C or higher than 42 °C, the diastolic blood pressure is lower than 50 mmHg or the systolic blood pressure is higher than 150 mmHg, the respiratory rate is lower than 10 times per minute, and the blood oxygen saturation is lower than 80% and the accumulated times reaches the threshold value, the step S126 is executed for judging to be the third danger level, namely, the high danger level. If the various threshold values are not exceeded and the accumulated times does not reach the threshold value, for example, the threshold value is two times, the step S128 is executed for the subsequent judgement.

As shown in FIG. 4C, after the third danger level is judged in the Step 126, the control steps for the third danger level are executed as follows:

Step S142a: Start;
 Step S142b: The VCU controlling the human-machine interface unit to display a reminding message for reminding the driver to turn off the message;

Step S142c: The driver turning off the message;

Step S142d: End;

Step S142e: The VCU notifying the audiovisual system to launch alarm sound or image for warning the driver;

Step S142f: The VCU driving the electric control unit to open the driver's window and control the warning lights of the vehicle to flash for warning the drivers of vehicles around;

Step S142g: The VCU intervening the power system and decelerating for maintaining an appropriate distance (threshold value) from vehicles around;

Step S142h: The VCU controlling the cellphone via the Bluetooth interface to transmit messages for notifying hospitals/families;

Step S142i: The VCU controlling the cellphone via the Bluetooth interface to transmit the GPS location to first-aid units; and

Step S142j: End.

As shown in the step S142a, the VCU 14 enters the control mode corresponding to the third danger level. As shown in the step S142b, the VCU 14 controls the human-machine interface unit 26 to display a reminding message.

Next, as shown in the step S142c, the VCU 14 judges if the driver has turned off the reminding message for judging whether the driver is responsive. When the reminding message is turned off, the step S142d is executed for ending the control mode corresponding to the third danger level. Once the reminding message is not turned off, as shown in the step S142e, the VCU 14 drives the human-machine interface unit 26 to display audiovisual effects via the audiovisual system for warning. Then, as shown in the step S142f, the VCU 14 drives the electric control unit 16 to control and open the window, as well as controlling the rear light signs of the vehicle to flash for warning the drivers of vehicles around. Afterwards, as shown in the step S142g, the VCU 14 drives the advanced driving assistance unit 20 to decelerate the vehicle 10 and maintain a safe distance from vehicles around, such as 5-50 meter.

Next, as shown in the step S142h, the VCU 14 transmits an emergency message to a cellphone (not shown in the figure) via the Bluetooth transmission interface for

transmitting the emergency message to a hospital or the families. As shown in the step S142i, the VCU 14 transmits the GPS coordinates to the cellphone via the Bluetooth transmission interface for transmitting the GPS coordinates to a first-aid unit. As shown in the step S142j, the control mode corresponding to the third danger level is ended.

FIG. 4D shows the method for judging the second danger level and comprising the steps S128a through S132 as shown below:

Step S128a: Blood oxygen saturation < Threshold value E2;

Step S128b: Blood pressure < Threshold value C2;

Step S128c: Accumulating times;

Step S128d: Accumulated times > Threshold value;

Step S130: Judging to be the second danger level; and

Step S132: Judging to be the first danger level.

According to the present embodiment, the second threshold values E2, C2 of the blood oxygen saturation and the blood pressure are 85% and 75 mmHg for diastolic blood pressure or 145 mmHg for systolic blood pressure, respectively. In other words, when the blood oxygen saturation is lower than 85%, the diastolic blood pressure is lower than 75 mmHg, and the systolic blood pressure is higher than 145 mmHg, and the accumulated times greater than the threshold value(for example, two times), the step S130 is executed for judging to be the second danger level. Otherwise, the step S132 is executed for judging to be the first danger level.

As shown in FIG. 4E, after the step S130, the following control steps for the second danger level are executed:

Step S144a: Start;

Step S144b: The VCU controlling the human-machine interface unit to display the reminding message for reminding the driver to turn off the message;

Step S144c: The driver turning off the message;

Step S144d: End;

Step S144e: The VCU notifying the audiovisual system to launch alarm sound or image for warning the driver;

Step S144f: The VCU driving the electric control unit to open the driver's window and control the warning lights of the vehicle to flash for warning the drivers of vehicles around;

Step S144g: The VCU intervening the power system and decelerating for maintaining an appropriate distance (threshold value) from vehicles around;

Step S142h: The driver turning off the message; and

Step S144i: End.

As shown in the step S144a, the VCU 14 enters the control mode corresponding to the second danger level. As shown in the step S144b, the VCU 14 controls the human-machine interface unit 26 to display a reminding message. Next, as shown in the step S144c, the VCU 14 judges if the driver has turned off the reminding message for judging whether the driver is responsive. When the reminding message is turned off, the step S144d is executed for ending the control mode corresponding to the second danger level. Once the reminding message is not turned off, as shown in the step S144e, the VCU 14 drives the human-machine interface unit 26 to display audiovisual effects via the audiovisual system for warning. Then, as shown in the step S144f, the VCU 14 drives the electric control unit 16 to control and open the window, as well as controlling the rear light signs of the vehicle to flash for warning the drivers of vehicles around. Afterwards, as shown in the step S144g, the VCU 14 drives the advanced driving assistance unit 20 to decelerate the vehicle 10 and maintain a safe distance from vehicles around, such as 60-200 meter. As shown in the step S144h, judge again if the driver has turned off the reminding message. When the reminding message is turned off, the step S144i is executed for ending the control mode corresponding to the second danger level. Once the reminding message is not turned off, the step S144b is executed for repeating reminding.

As shown in FIG. 4F, the step S132 is executed for judging the danger level to be the first danger level. The control steps for the first danger level comprise:

Step S146a: Start;

Step S146b: The VCU controlling the human-machine interface unit to display the reminding message for reminding the driver to turn off the message;

Step S146c: The driver turning off the message;

Step S146d: The VCU notifying the audiovisual system to launch alarm sound or image for warning the driver;

Step S146e: The driver turning off the message; and

Step S146f: End.

As shown in the step S146a, the VCU 14 enters the control mode corresponding to the first danger level. As shown in the step S146b, the VCU 14 controls the human-machine interface unit 26 to display a reminding message. Next, as shown in the step S146c, the VCU 14 judges if the driver has turned off the reminding message for judging whether the driver is responsive. When the reminding message is turned off, the step S146f is executed for ending the control mode corresponding to the first danger level. Once the reminding message is not turned off, as shown in the step S146d, the VCU 14 drives the human-machine interface unit 26 to display audiovisual effects via the audiovisual system for warning. Then, as shown in the step S146e, judge again if the driver has turned off the reminding message. When the reminding message is turned off, the step S146f is executed for ending the control mode corresponding to the first danger level. Once the reminding message is not turned off, the step S146b is executed for repeating reminding.

Accordingly, the present disclosure conforms to the legal requirements owing to its novelty, nonobviousness, and utility. However, the foregoing description is only embodiments of the present disclosure, not used to limit the scope and range of the present disclosure. Those equivalent changes or modifications made according to the shape, structure, feature, or spirit described in the claims of the present disclosure are included in the appended claims of the present disclosure.

CLAIMS

1. A method for integrating vital signs monitoring with vehicle control, applicable to a vehicle control unit of a vehicle, and comprising steps of:
 - receiving two or more vital-sign signals generated by a sensing device, wherein said vital-sign signals include a blood pressure, a pulse rate, a body temperature, a respiratory rate, and a blood oxygen saturation;
 - judging a driving status according to two or more threshold values of said vital-sign signals, and judging a danger level of said driving status once said driving status is judged bad;
 - judging the danger level of said driving status to be a third danger level when each of said vital-sign signals exceeds a third threshold value thereof, and accumulated times reaching a threshold value;
 - judging the danger level of said driving status to be a second danger level when each of the blood pressure, the body temperature, and the blood oxygen saturation is between a second threshold value and the third threshold value thereof, and accumulated times reaching a threshold value;
 - judging the danger level of said driving status to be a first danger level when each of the blood pressure, the body temperature, and the blood oxygen saturation is between a first threshold value and the second threshold value thereof, and accumulated times reaching a threshold value; and
 - controlling said vehicle according to the danger level of said driving status.
2. The method of claim 1, wherein said sensing device is a wearable sensing device that senses two or more of the driver's blood pressure, the pulse rate, the body temperature, the respiratory rate, and the blood oxygen saturation for generating said vital-sign signals.
3. The method of claim 1 or 2, wherein said vehicle control unit integrates a motor control unit (MCU), a battery management system (BMS), an electric power steering control system, an electric cooling control system, an in-vehicle charger, and a direct-current (DC) voltage converter.
4. The method of any one of claims 1 to 3, wherein said vehicle control unit controls a

human-machine interface unit to output a reminding message in said step of controlling said vehicle according to the danger level of said driving status.

5. The method of any one of claims 1 to 4, wherein said vehicle control unit controls a human-machine interface unit to output a warning message in said step of controlling said vehicle according to the danger level of said driving status.
6. The method of any one of claims 1 to 5, wherein said vehicle control unit controls said vehicle to maintain a safe distance from vehicles around and displays light signs in said step of controlling said vehicle according to the danger level of said driving status.
7. The method of any one of claims 1 to 6, wherein said vehicle control unit further triggers a communication device to transmit an emergency message to a first-aid unit in said step of controlling said vehicle according to the danger level of said driving status.