

Claims

1. An autonomous driving system comprising:
a plurality of autonomous driving vehicles;
wherein each of the autonomous driving vehicles comprises:
a control device that sets a travelable area in which the autonomous driving vehicle can travel in a process of going to a destination, and determines one lane as a standard travel lane in a multiple-lane area including two or more lanes in the travelable area;
wherein the control device executes:
processing of generating random numbers;
processing of reading lane threshold values; and
lane determination processing of determining the standard travel lane based on comparison of the random numbers and the lane threshold values; and
wherein the control devices installed in the individual autonomous driving vehicles are configured so that dispersion occurs to the standard travel lanes which the plurality of autonomous driving vehicles determine in a same multiple-lane area placed under a same environment.
2. The autonomous driving system according to claim 1,
wherein the lane determination processing comprises
processing of determining a temporary travel lane in the multiple-lane area based on information concerning travel of the vehicle, and

processing of determining whether to set the temporary travel lane as the standard travel lane, or to set a lane different from the temporary travel lane as the standard travel lane, based on comparison of the random numbers and the lane threshold values.

3. The autonomous driving system according to claim 1 or 2,
wherein the control device executes
processing of setting vehicle distribution targets in the multiple-lane area, and
processing of setting the lane threshold values in correspondence with the
distribution targets.
4. An autonomous driving system comprising:
a plurality of autonomous driving vehicles;
wherein each of the autonomous driving vehicles comprises:
a control device that sets a travelable area in which the autonomous
driving vehicle can travel in a process of going to a destination, and determines one lane
as a standard travel lane in a multiple-lane area including two or more lanes in the
travelable area;
wherein the control device stores a lane characteristic value, and determines the
standard travel lane based on the lane characteristic value;
wherein the lane characteristic values stored in the respective plurality of
autonomous driving vehicles have dispersion; and
wherein the control devices installed in the individual autonomous driving
vehicles are configured so that dispersion occurs to the standard travel lanes which the

plurality of autonomous driving vehicles determine in a same multiple-lane area placed under a same environment.

5. The autonomous driving system according to claim 4,
wherein the control device executes
processing of generating random numbers,
threshold value setting processing of setting lane threshold values based on the
lane characteristic value, and
processing of determining the standard travel lane based on comparison of the
random numbers and the lane threshold values.
6. The autonomous driving system according to claim 5,
wherein the control device executes
processing of setting vehicle distribution targets in the multiple-lane area, and
processing of setting such a relation between the lane characteristic value and the
lane threshold value that the distribution targets are realized when the lane characteristic
value is dispersed in an entire range of a variation region, and
sets the lane threshold values by applying a lane characteristic value of an own
vehicle to the relation, in the threshold value setting processing.
7. The autonomous driving system according to claim 4,
wherein the control device executes
threshold value setting processing of setting lane threshold values that are used in
common in the plurality of autonomous driving vehicles, and

processing of determining the standard travel lane based on comparison of the lane threshold values and the lane characteristic value.

8. The autonomous driving system according to claim 7, wherein
the control device executes processing of setting vehicle distribution targets in the multiple-lane area, and
the threshold value setting processing includes processing of setting the lane threshold values in correspondence with the distribution targets.

9. The autonomous driving system according to any one of claims 4 to 8, wherein the control device executes
processing of detecting a characteristic concerning lane selection of a driver of a vehicle, and
processing of reflecting the characteristic in the lane characteristic value.

10. The autonomous driving system according to any one of claims 3, 6 and 8, wherein the control device executes
processing of acquiring real vehicle distribution in the multiple-lane area, and
processing of correcting the lane threshold values so that the real vehicle distribution approaches the distribution targets.

11. The autonomous driving system according to any one of claims 3, 6, 8 and 10, wherein the control device executes

processing of extracting a change point where the distribution targets change on a route to the destination,

processing of setting one section in a multiple-lane area including the change point as a gradual changing area, and

processing of gradually changing the distribution targets in the gradual changing area from a distribution before the change to a distribution after the change.

12. The autonomous driving system according to any one of claims 1 to 11, wherein the control device executes

processing of detecting an no-change recommendation phenomenon in which keep of a lane is recommended, and

processing of determining the standard travel lane in a mode that causes the plurality of autonomous driving vehicles placed under a same environment to make a same decision when the no-change recommendation phenomenon is detected.

13. An autonomous driving vehicle having a function of performing autonomous travel toward a destination, comprising:

a control device that sets a travelable area in which the autonomous driving vehicle can travel in a process of going to the destination, and determines one lane as a standard travel lane in a multiple-lane area including two or more lanes in the travelable area;

wherein the control device is configured so that dispersion occurs to the standard travel lane that is determined in a same multiple-lane area placed under a same environment;

wherein the control device executes:

processing of generating random numbers;

processing of reading lane threshold values; and

lane determination processing of determining the standard travel lane

based on comparison of the random numbers and the lane threshold values.

14. The autonomous driving vehicle according to claim 13, wherein the lane determination processing comprises:

processing of determining a temporary travel lane in the multiple-lane area based on information concerning travel of the vehicle, and

processing of determining whether to set the temporary travel lane as the standard travel lane, or to set a lane different from the temporary travel lane as the standard travel lane, based on comparison of the random numbers and the lane threshold values.

15. The autonomous driving vehicle according to claim 13 or 14, wherein the control device executes

processing of setting vehicle distribution targets in the multiple-lane area, and

processing of setting the lane threshold values in correspondence with the distribution targets.

16. An autonomous driving vehicle having a function of performing autonomous travel toward a destination, comprising:

a control device that sets a travelable area in which the autonomous driving vehicle can travel in a process of going to the destination, and determines one lane as a standard travel lane in a multiple-lane area including two or more lanes in the travelable area,

wherein the control device is configured so that a probability of each of individual lanes being determined as the standard travel lane in a same multiple-lane area placed under a same environment becomes a fixed value except for 100% for each of the lanes.

17. The autonomous driving vehicle according to claim 16, wherein the control device stores a lane characteristic value, and executes processing of generating random numbers, threshold value setting processing of setting lane threshold values based on the lane characteristic value, and processing of determining the standard travel lane based on comparison of the random numbers and the lane threshold values.

18. The autonomous driving vehicle according to claim 17, wherein the control device executes processing of setting vehicle distribution targets in the multiple-lane area, and processing of setting such a relation between the lane characteristic value and the lane threshold values that the distribution targets are realized when the lane characteristic value disperses in an entire range of a variation region, and

sets the lane threshold values by applying a lane characteristic value of a vehicle to the relation, in the threshold value setting processing.

19. The autonomous driving vehicle according to claim 16, wherein the control device stores a lane characteristic value, and executes threshold value setting processing of setting lane threshold values corresponding to the respective lanes of the multiple-lane area, and processing of determining the standard travel lane based on comparison of the lane threshold values and the lane characteristic value.

20. The autonomous driving vehicle according to claim 19, wherein the control device executes processing of setting vehicle distribution targets in the multiple-lane area, and the threshold value setting processing includes processing of setting the lane threshold value in correspondence with the distribution targets.

21. The autonomous driving vehicle according to any one of claims 17 to 20, wherein the control device executes processing of detecting a characteristic concerning lane selection of a driver of an own vehicle, and processing of reflecting the characteristic in the lane characteristic value.

22. The autonomous driving system according to any one of claims 15, 18 and 20, wherein the control device executes

processing of acquiring real vehicle distribution in the multiple-lane area, and

processing of correcting the lane threshold values so that the real vehicle distribution approaches the distribution targets.

23. The autonomous driving vehicle according to any one of claims 15, 18, 20 and 22, wherein the control device executes

processing of extracting a change point where the distribution targets change on a route to the destination,

processing of setting one section in a multiple-lane area including the change point as a gradual changing area, and

processing of gradually changing the distribution targets in the gradual changing area from a distribution before the change to a distribution after the change.

24. The autonomous driving vehicle according to any one of claims 13 to 23, wherein the control device executes

processing of detecting an no-change recommendation phenomenon in which keep of a lane is recommended, and

processing of determining the standard travel lane in a mode in which same decision is made under a same environment when the no-change recommendation phenomenon is detected.