CLAIMS

[Claim 1]

A route setting method, comprising the steps of:

acquiring information about a target position of a moving body;

acquiring information about a position of an obstacle; and

executing route calculation of the moving body, wherein

the step of executing the route calculation includes the steps of:

setting, based on information regarding a shape of the moving body, a moving body area that overlaps an occupied area including an area occupied by the moving body and has a shape in which a plurality of circular or elliptical unit areas are partially superimposed on each other; and

setting, based on the information about the position of the obstacle, a route to the target position along which the obstacle does not overlap with the moving body area, as a route for the moving body.

[Claim 2]

The route setting method according to claim 1, wherein the step of executing the route calculation includes the steps of:

setting, based on the position of the moving body, the moving body area, and the position of the obstacle, a constraint condition that the position of the obstacle is outside the moving body area; and

calculating the route for the moving body by performing optimization calculation based on an evaluation function in which evaluation increases as a difference between the position of the moving body and the target position decreases, and based on the constraint condition.

[Claim 3]

The route setting method according to claim 1 or 2, wherein the step of setting the moving body area includes setting the moving body area such that a first unit area that is the unit area overlapping the area occupied by the moving body, a second unit area that is the unit area overlapping a front area on a traveling direction side of the

moving body, and a third unit area that is the unit area overlapping a rear area on a side opposite to the traveling direction of the moving body are included and that at least two of the first unit area, the second unit area, and the third unit area overlap each other.

[Claim 4]

The route setting method according to claim 1 or 2, wherein the step of setting the moving body area includes the steps of:

setting a number of the unit areas included in the moving body area;

partitioning the occupied area into unit occupied areas as many as the unit areas; and

setting the moving body area for each of the unit occupied areas by setting a constraint condition that a unit area among the unit areas overlaps with a position on a peripheral edge of the unit occupied area, setting an area size of the unit area as an evaluation function, executing optimization calculation that minimizes the evaluation function while the constraint condition is satisfied, and setting a position and a size of each of the unit areas.

[Claim 5]

The route setting method according to claim 4, wherein

the step of setting the moving body area includes, in a case where it is not possible to set a route to the target position on which the obstacle does not overlap the moving body area, increasing the number of the unit areas to reset the moving body area, and

the step of executing the route calculation includes setting the route for the moving body based on the reset moving body area.

[Claim 6]

The route setting method according to claim 4, wherein

the step of setting the moving body area includes:

setting the occupied area based on a planned speed of the moving body such that the occupied area becomes wider as the planned speed becomes faster; and

in the case where it is not possible to set a route to the target position on

which the obstacle does not overlap the moving body area, resetting the occupied area by decreasing the planned speed, and resetting the moving body area based on the reset occupied area, and

the step of executing the route calculation includes setting the route for the moving body based on the reset moving body area.

[Claim 7]

The route setting method according to claim 4, wherein the step of setting the moving body area includes further setting upper and lower limit values of a major axis radius and upper and lower limit values of a minor axis radius of the unit areas, as the constraint condition.

[Claim 8]

The route setting method according to claim 1 or 2, wherein

the step of setting the moving body area includes the steps of:

setting a constraint condition that a position on a peripheral edge of the occupied area overlaps with at least one of the unit areas and setting a difference between the moving body areas and the occupied area as an evaluation function; and

setting the moving body area by executing optimization calculation that minimizes the evaluation function while the constraint condition is satisfied and by setting a number of the unit areas and a size and a position of each of the unit areas.

[Claim 9]

A moving body, wherein the moving body is caused to travel in accordance with the route set by the route setting method according to claim 1 or 2.

[Claim 10]

A moving body comprising:

a route acquiring unit that acquires a route to a target position on which an obstacle does not overlap with a moving body area, the route being set based on information about a position of the obstacle; and

a traveling control unit that causes the moving body to travel in accordance with

the route, wherein

the moving body area is an area that overlaps an occupied area including an area occupied by the moving body and that has a shape in which a plurality of circular or elliptical unit areas are partially superimposed on each other, the area being set based on information regarding a shape of the moving body.

[Claim 11]

A management system that transmits the route set by the route setting method according to claim 1 or 2 to the moving body.

[Claim 12]

A computer-readable recording medium having stored thereon a program for causing a computer to execute the steps of:

acquiring information about a target position of a moving body;

acquiring information about a position of an obstacle; and

executing route calculation of the moving body, wherein

the step of executing the route calculation includes the steps of:

setting, based on information regarding a shape of the moving body, a moving body area that overlaps an occupied area including an area occupied by the moving body and has a shape in which a plurality of circular or elliptical unit areas are partially superimposed on each other; and

setting, based on the information about the position of the obstacle, a route to the target position along which the obstacle does not overlap with the moving body area, as a route for the moving body.