

~~{Type of Document} Claim(s)~~

CLAIMS

[Claim 1]

A management method for a mobile object, comprising:_

a step of acquiring movement conditions for ~~the~~ first mobile object that automatically moves; and_

a step of setting based on the movement conditions a safety region as a region on a traveling direction side of the first mobile object in which an object is not expected to be positioned, wherein_

the step of setting the safety region includes setting the safety region so that the safety region is widened in a lateral direction intersecting with the traveling direction as a speed of the ~~mobile object increases,~~

~~the step of acquiring the movement conditions includes, based on a maximum value of a steering angle command and a maximum value of a steering angular speed that are able to be input to the mobile object,~~first mobile object increases, and

~~acquiring a steering angle command for each time for orienting the mobile object toward one side of the lateral direction earliest as a first reference value of the steering angle command, and~~

~~acquiring a steering angle command for each time for orienting the mobile object toward the other side of the lateral direction earliest as a second reference value of the steering angle command, and~~

~~the step of setting the safety region includes setting the safety region to include a first assumed arrival position at the time when the first reference value is input to the mobile object and a second assumed arrival position at the time when the second reference value is~~

~~input to the mobile object.~~

~~[Claim 2]~~

~~— A management method for a mobile object, the management method is further comprising:~~

~~— a step of acquiring movement conditions for the mobile object that automatically moves; and~~

~~— a step of setting based on the movement conditions a safety region as a region on a traveling direction side of the mobile object in which an object is not expected to be positioned, wherein~~

~~— the step of setting the safety region includes setting the safety region so that the safety region is widened in a lateral direction intersecting with the traveling direction as a speed of the mobile object increases,~~

~~— the step of acquiring the movement conditions includes information on a measurement position as a position in the lateral direction of the mobile object, the measurement position being measured in advance at the time when a steering angle command of the mobile object is fixed, and~~

~~— the step of setting the safety region includes setting the safety region to include~~

~~— a first assumed arrival position as a position on one side of the lateral direction with respect to the~~

~~mobile object that is set based on the measurement position, and~~

~~_____ a second assumed arrival position as a position on the other side of the lateral direction with respect to the mobile object that is set based on the measurement position.~~

~~[Claim 3]~~

~~_____ The management method for the mobile object according to claim 2, wherein the step of acquiring the movement conditions includes calculating the first assumed arrival position and the second assumed arrival position by inputting the speed of the mobile object to a learning model that has performed machine learning about a correspondence relation between the speed of the mobile object and the measurement position.~~

~~[Claim 4]~~

~~_____ The management method for the mobile object according to any one of claims 1 to 3, wherein the step of acquiring the movement conditions includes acquiring a reference value of a torque command for stopping the mobile object, and~~

~~_____ the step of setting the safety region includes setting also based on the reference value of the torque command the first assumed arrival position and the second assumed arrival position.~~

~~[Claim 5]~~

~~_____ The management method for the mobile object according to any one of claims 1 to 3, further comprising:~~

~~_____ a step of setting an upper limit speed of the mobile object, wherein~~

~~_____ the step of setting the upper limit speed includes setting the upper limit speed so that the object is not positioned in the safety region in a case in which the mobile object moves at the upper limit speed.~~

~~[Claim 6]~~

~~_____ The management method for the mobile object according to any one of claims 1 to 3, further comprising: _~~

a step of determining, in a case in which athe first mobile object is scheduled to move toward a first direction in a passage in which a first route running toward the first direction and a second route arranged side by side with the first route in athe lateral direction are set, whether a second mobile object is scheduled to move in the passage in the same time period; and _

a step of causing, in a case in which the second mobile object is not scheduled to move in the passage in the same time period, a center route positioned to be closer to the second route side than the first route to be a route for the first mobile object.

[Claim 2]

The management method for the mobile object according to claim 1, wherein
the step of acquiring the movement conditions includes acquiring a reference value of a steering angle command for the first mobile object, and
the step of setting the safety region includes setting the safety region to include an assumed arrival position at which the first mobile object is assumed to arrive at a time of stoppage in a case in which the reference value of a steering angle command is input.

[Claim 3]

The management method for the mobile object according to claim 2, wherein
the step of acquiring the movement conditions includes acquiring a reference value of a torque command for stopping the first mobile object,
the step of setting the safety region includes setting the safety region to include the assumed arrival position at which the first mobile object is assumed to arrive at the time of stoppage in a case in which the reference value of a steering angle command and the reference value of the torque command are input.

[Claim 4]

The management method for the mobile object according to any one of claims 1 to 3, further comprising:
a step of setting an upper limit speed of the first mobile object, wherein
the step of setting the upper limit speed includes setting the upper limit speed so that the object is not positioned in the safety region in a case in which the first mobile object moves at the upper limit speed.

[Claim 5]

6. The management method for the mobile object according to any one of claims 1 to 4, further comprising:

—

— a step of causing, in a case in which the second mobile object is scheduled to move in the passage in the same time period, the first route to be a route for the first mobile object and causing the second route to be a route for the second mobile object.

[Claim ~~8~~6]

The management method for the mobile object according to ~~claim 6~~ any one of claims 1 to 4, wherein,
 _____ in a case in which the second mobile object is scheduled to move in the passage in the same time period, and in a case in which preference information indicating that the first mobile object is preferentially caused to move is acquired, the center route is caused to be a route for the first mobile object.

[Claim ~~9~~7]

A control method for a mobile object, comprising: _____ a step of acquiring movement conditions for the mobile object that automatically moves; and _____ a step of setting based on the movement conditions a safety region as a region on a traveling direction side of the mobile object in which an object is not expected to be positioned, wherein

— _____ the step of setting the safety region includes setting the safety region so that the safety region is widened in a lateral direction intersecting with the traveling direction as a speed of the mobile object increases, and

_____ the control method is further comprising:

— a step of acquiring information on the safety region ~~that is set by the management method for the mobile object according to any one of claims 1 to 3; and~~

— a step of causing the mobile object to move while detecting whether the object is not positioned in the safety region.

[Claim ~~10~~];

~~_____ The control method for the mobile object according to claim 9, further comprising:~~

a step of detecting whether another mobile object is present in a first distance range on ~~a~~ the traveling direction side of the mobile object; _____

a step of detecting whether the object the position of which is fixed is present in a second distance range on ~~a~~ the lateral direction side of the mobile object; and _____

a step of switching a route along which the mobile object moves to the lateral direction side in a case in which another mobile object is absent in the first distance range and the object is absent in the second distance range.

[Claim 11]

~~A mobile object that automatically moves, comprising:~~
~~a safety region acquisition unit that acquires information on a safety region that is set based on movement conditions for the mobile object as a region on a traveling direction side of the mobile object in which an object is not expected to be positioned; and~~
~~a movement control unit that causes the mobile object to move while detecting whether the object is not positioned in the safety region, wherein~~
~~the safety region is set to be widened in a lateral direction intersecting with the traveling direction as a speed of the mobile object increases, and to include a first assumed arrival position at the time when a first reference value is input to the mobile object and a second assumed arrival position at the time when a second reference value is input to the mobile object,~~
~~the first reference value is a steering angle command for each time for orienting the mobile object toward one side of the lateral direction earliest that is set based on a maximum value of the steering angle command and a maximum value of a steering angular speed that are able to be input to the mobile object, and~~
~~the second reference value is a steering angle command for each time for orienting the mobile object toward the other side of the lateral direction earliest that is set based on the maximum value of the steering angle command and the maximum value of the steering angular speed that are able to be input to the mobile object.~~

[Claim 12]

A mobile object that automatically moves, comprising:
 a safety region acquisition unit that acquires information on a safety region that is set based on movement conditions for the mobile object as a region on a traveling direction side of the mobile object in which an object is not expected to be positioned; and
 a movement control unit that causes the mobile object to move while detecting whether the object is not positioned in the safety region, wherein
 the safety region is ~~set to be~~ widened in a lateral direction intersecting with the traveling direction as a speed of the mobile object increases, ~~and to include~~ wherein
the mobile object determines, in a case in which the mobile object is scheduled to move toward a first assumed arrival position as a position on one side of the lateral direction with respect to the mobile object in a passage in which a first route running toward the first direction and a second route arranged side by side with the first route in the lateral direction are set, whether a second mobile object different from the mobile object is scheduled to move in the passage in the same time period; and
causes, in a case in which the second mobile object is not scheduled to move in the passage in the same time period, a center route positioned to be closer to the second route

side than the first route to be a route for the mobile object.

[Claim 9]

A mobile object that automatically moves, comprising:
a safety region acquisition unit that acquires information on a safety region that is
set based on movement conditions for the mobile object as a region on a traveling direction
side of the mobile object in which an object is not expected to be positioned; and
a movement control unit that causes the mobile object to move while detecting
whether the object is not positioned in the safety region, wherein
~~assumed arrival position as a position on the other side of the~~ the safety region is widened in a
~~lateral direction intersecting with respect to the traveling direction as a speed of the mobile~~
~~object, and~~
~~the first assumed arrival position and~~ increases, wherein
~~the second assumed arrival position are set based~~ movement control unit is comprising:
acquiring information on a measurement position as a position ~~the safety region;~~
~~causing the mobile object to move while detecting whether the object is not~~
~~positioned in the lateral direction safety region;~~
~~detecting whether another mobile object is present in a first distance range on the~~
~~traveling direction side of the mobile object measured in advance at;~~
~~detecting whether the time when object the steering angle command position of the mobile~~
~~object which is fixed is present in a second distance range on the lateral direction side of the~~
~~mobile object; and~~
~~switching a route along which the mobile object moves to the lateral direction side~~
~~in a case in which another mobile object is absent in the first distance range and the object~~
~~is absent in the second distance range.~~

[Claim 10]

~~A non-transitory computer-readable recording medium storing a~~ A ~~computer program that~~
~~causes a computer to execute:~~
a step of acquiring movement conditions for a first mobile object that automatically
moves; and
a step of setting based on the movement conditions a safety region as a region on
a traveling direction side of the first mobile object in which an object is not expected to be
positioned, wherein
the step of setting the safety region includes setting the safety region so that the

safety region is widened in a lateral direction intersecting with the traveling direction as a speed of the ~~mobile object increases,~~

~~the step of acquiring the movement conditions includes, based on a maximum value of a steering angle command and a maximum value of a steering angular speed that are able to be input to the mobile object,~~first mobile object increases, and

~~acquiring a steering angle command for each time for orienting the~~ computer program is further comprising:

a step of determining, in a case in which the first mobile object is scheduled to move toward one a first direction in a passage in which a first route running toward the first direction and a second route arranged side of by side with the first route in the lateral direction earliest as a first reference value of the steering angle command, and

~~acquiring a steering angle command for each time for orienting the~~ are set, whether a second mobile object is scheduled to move in the passage in the same time period; and toward the other side of the lateral direction earliest as a second reference value of the steering angle command, and

~~the step of setting the safety region includes setting the safety region to include a first assumed arrival position at~~

a step of causing, in a case in which the second mobile object is not scheduled to move in the passage in the same time period, a center route positioned to be closer to the time when second route side than the first reference value is input route to be a route for the mobile object and a second assumed arrival position at the time when the second reference value is input to the first mobile object.

[Claim 11]

~~A non-transitory computer-readable recording medium storing a~~ A computer program that causes a computer to execute: _

a step of acquiring movement conditions for a mobile object that automatically moves; and _

a step of setting based on the movement conditions a safety region as a region on a traveling direction side of the mobile object in which an object is not expected to be positioned, wherein _

the step of setting the safety region includes setting the safety region so that the

safety region is widened in a lateral direction intersecting with the traveling direction as a speed of the mobile object increases,

~~the step of acquiring the movement conditions includes information on a measurement position as a position in the lateral direction of the mobile object is acquired, the measurement position being measured in advance at the time when a steering angle command of the mobile object is fixed, and~~

~~the step of setting the safety region includes setting the safety region to include and the computer program is further executing:~~

~~a step of acquiring information on the safety region;~~

~~a step of causing the mobile object to move while detecting whether the object is not positioned in the safety region;~~

~~a step of detecting whether another mobile object is present in a first assumed arrival position as a position on one distance range on the traveling direction side of the mobile object;~~

~~a step of detecting whether the object the position of which is fixed is present in a second distance range on the lateral direction side of the mobile object; and with respect to the mobile object that is set based on the measurement position, and~~

~~a step of switching a route along which the mobile object moves to the lateral direction side in a case in which another mobile object is absent in the first distance range and the object is absent in the second distance range.~~

~~a second assumed arrival position as a position on the other side of the lateral direction with respect to the mobile object that is set based on the measurement position.~~