~~What is claimed is~~CLAIMS:

1. A configuration method, comprising:

acquiring transmission indication information; and

determining a spatial relation associated with an uplink control channel corresponding to the transmission indication information during repeated transmissions of the uplink control channel;

wherein the transmission indication information comprises at least one of radio resource control (RRC) signaling, a media access control-control element, or downlink control information.

~~2. The method of claim 1, wherein,~~

~~the transmission indication information comprises at least one of radio resource control (RRC) signaling, a media access control-control element, or downlink control information; and~~

~~the uplink control channel comprises a physical uplink control channel.~~

~~3~~2. The method of claim 1, wherein the determining the spatial relation associated with the uplink control channel corresponding to the transmission indication information during repeated transmissions of the uplink control channel, comprises at least one of the following:

determining at least one spatial relation associated with the uplink control channel during uplink transmission of the uplink control channel according to at least one state that is activated for a physical uplink control channel (PUCCH) resource and by a media access control-control element included in the transmission indication information and a PUCCH resource for transmission of the uplink control channel indicated by downlink control information; or

determining at least one spatial relation associated with the uplink control channel during uplink transmission of the uplink control channel according to group identification information activated by a media access control-control element included in the transmission indication information and a PUCCH resource for transmission of the uplink control channel indicated by downlink control information;

wherein the group identification information is identification information of a group formed by grouping higher-layer parameters indicating spatial relations, and at least one spatial relation is

included within the group.

43. The method of claim 1, wherein in a case where a number of the spatial relations associated with the uplink control channel is at least two during repeated transmissions of the uplink control channel and is configured with inter-slot frequency hopping or no frequency hopping, a matching manner for spatial relations during the repeated transmission of the uplink control channel is determined according to an actual transmission occasion index.

54. The method of claim 4, wherein

in a case where the number of the spatial relations associated with the uplink control channel is two,

a starting spatial relation of the uplink control channel in a group comprising even slots and a starting spatial relation of the uplink control channel in a group comprising odd slots are each a first spatial relation; or a starting spatial relation of the uplink control channel in a group comprising even slots and a starting spatial relation of the uplink control channel in a group comprising odd slots are each a second spatial relation; or

a starting spatial relation of the uplink control channel in a group comprising even slots is a first spatial relation and a starting spatial relation of the uplink control channel in a group comprising odd slots is a second spatial relation; or a starting spatial relation of the uplink control channel in a group comprising even slots is a second spatial relation and a starting spatial relation of the uplink control channel in a group comprising odd slots is a first spatial relation.~~a starting spatial relation of the uplink control channel in a group comprising even slots is the same as a starting spatial relation of the uplink control channel in a group comprising odd slots, and spatial relations in each intra-group are matched in a sequential order or in a cyclical order according to the actual transmission occasion index; or~~

~~a starting spatial relation of the uplink control channel in a group comprising even slots is different from a starting spatial relation of the uplink control channel in a group comprising odd slots, and spatial relations in each intra-group are matched in a sequential order or in a cyclical order according to the actual transmission occasion index.~~

~~6. The method of claim 5, wherein in a case where the number of the spatial relations associated with the uplink control channel is two, the starting spatial relation of the uplink control channel~~

~~in the group comprising even slots is the same as the starting spatial relation of the uplink control channel in the group comprising odd slots comprises:~~

~~the starting spatial relation of the uplink control channel in the group comprising even slots and the starting spatial relation of the uplink control channel in the group comprising odd slots are each a first spatial relation; or~~

~~the starting spatial relation of the uplink control channel in the group comprising even slots and the starting spatial relation of the uplink control channel in the group comprising odd slots are each a second spatial relation.~~

~~7. The method of claim 5, wherein in a case where a number of the spatial relations associated with the uplink control channel is two, the starting spatial relation of the uplink control channel in the group comprising even slots is different from the starting spatial relation of the uplink control channel in the group comprising odd slots comprises:~~

~~the starting spatial relation of the uplink control channel in the group comprising even slots is a first spatial relation, and the starting spatial relation of the uplink control channel in the group comprising odd slots is a second spatial relation; or~~

~~the starting spatial relation of the uplink control channel in the group comprising even slots is a second spatial relation, and the starting spatial relation of the uplink control channel in the group comprising odd slots is a first spatial relation.~~

~~8~~5. The method of claim ~~5~~4, wherein a number of transmissions of different spatial relations is the same, and the number of transmissions is a sum of a number of transmissions of a spatial relation in the group comprising even slots and a number of transmissions of the same spatial relation in the group comprising odd slots.

~~9~~6. The method of claim ~~5~~4, wherein in a case where the number of the repeated transmission associated with the uplink control channel is N+M and the number of the spatial relations associated with the uplink control channel is two,

a number of transmissions of a first spatial relation in the group comprising even slots is $\lfloor N/2 \rfloor$, a number of transmissions of a second spatial relation in the group comprising even slots is

$N-\lfloor N/2 \rfloor$, a number of transmissions of the first spatial relation in the group comprising odd slots is $M-\lfloor M/2 \rfloor$, and a number of transmissions of the second spatial relation in the group comprising odd slots is $\lfloor M/2 \rfloor$; or

a number of transmissions of a first spatial relation in the group comprising even slots is $N-\lfloor N/2 \rfloor$, a number of transmissions of a second spatial relation in the group comprising even slots is $\lfloor N/2 \rfloor$, a number of transmissions of the first spatial relation in the group comprising odd slots is $\lfloor M/2 \rfloor$, and a number of transmissions of the second spatial relation in the group comprising odd slots is $M-\lfloor M/2 \rfloor$;

and wherein a number of transmissions in even slots is N and a number of transmissions in odd slots is M, and N and M are positive integers.

10. The method of claim 5, wherein in a case where the number of the repeated transmission associated with the uplink control channel is N+M and the number of the spatial relations associated with the uplink control channel is two, a number of transmissions of a first spatial relation in the group comprising even slots is $N-\lfloor N/2 \rfloor$, a number of transmissions of a second spatial relation in the group comprising even slots is $\lfloor N/2 \rfloor$, a number of transmissions of the first spatial relation in the group comprising odd slots is $\lfloor M/2 \rfloor$, and a number of transmissions of the second spatial relation in the group comprising odd slots is $M-\lfloor M/2 \rfloor$; and wherein a number of transmissions in even slots is N and a number of transmissions in odd slots is M, and N and M are positive integers.

11<u>7</u>. The method of claim 1, wherein in a case where the uplink control channel is associated with at least two spatial relations and is configured with inter-slot frequency hopping or no frequency hopping, a matching manner of the spatial relations associated with the uplink control channel and a matching relationship of repeated transmissions is determined according to an absolute slot index.

~~12~~8. The method of claim 7~~11~~, wherein an even slot and an odd slot respectively correspond to different spatial relations associated with the uplink control channel.

~~13~~9. The method of claim 8~~12~~, wherein in a case where the number of the spatial relations associated with the uplink control channel is two, the even slot and the odd slot respectively correspond to different spatial relations associated with the uplink control channel comprises:

the even slot is associated with a first spatial relation, and the odd slot is associated with a second spatial relation; or

the even slot is associated with a second spatial relation, and the odd slot is associated with a first spatial relation.

~~14~~10. The method of claim ~~11~~7, wherein determining the spatial relations associated with the uplink control channel according to the absolute slot index comprises:

grouping transmission slots starting from a starting transmission slot, each group comprising M slots, and M being greater than or equal to 2; wherein,

an even-numbered group corresponds to a first spatial relation, and an odd-numbered group corresponds to a second spatial relation; or

an even-numbered group corresponds to a second spatial relation, and an odd-numbered group corresponds to a first spatial relation.

~~15~~11. The method of claim 1, wherein a number of repetitions of the uplink control channel is semi-statically indicated by a higher-layer parameter, dynamically indicated by downlink control signaling, or dynamically indicated by a combination of a higher-layer parameter and downlink control signaling.

~~16~~12. The method of claim 1, wherein,

in a case where a higher-layer parameter indicates that a number of repetitions is 1, and a sum of a starting symbol position, a transmission interval, and 2 times a duration of the uplink control channel is less than or equal to a slot symbol length, the uplink control channel is transmitted repeatedly within a slot;

in a case where a higher-layer parameter indicates that a number of repetitions is 1, and a sum of a starting symbol position, a transmission interval, and 2 times a duration of the uplink control channel is greater than a slot symbol length, the uplink control channel is not transmitted repeatedly; or

in a case where a higher-layer parameter indicates that a number of repetitions is greater than or equal to 2, the uplink control channel is transmitted repeatedly between slots;

wherein the transmission interval is a symbol interval between two repeated transmissions of a PUCCH, the transmission interval is semi-statically indicated by a higher-layer parameter or dynamically indicated by downlink control signaling, and in a case where the transmission interval is not indicated, a value of the transmission interval is a set value.

~~17~~13. The method of claim 1, wherein,

in a case where a higher-layer parameter indicates that a number of repetitions is 1 and a number of repetitions of the uplink control channel indicated by downlink control signaling is 1, the uplink control channel is not transmitted repeatedly;

in a case where a higher-layer parameter indicates that a number of repetitions is 1 and a number of repetitions of the uplink control channel indicated by downlink control signaling is 2, the uplink control channel is transmitted repeatedly within a slot; or

in a case where a higher-layer parameter indicates that a number of repetitions is not 1 or a number of repetitions of the uplink control channel indicated by downlink control signaling is not 1 or 2, the uplink control channel is transmitted repeatedly between slots, and the number of repetitions of the uplink control channel is indicated by the higher-layer parameter or the downlink control signaling.

~~18~~14. The method of claim 1, wherein,

in a case where downlink control signaling indicates that a number of repetitions is 1 and a sum of a starting symbol position, a transmission interval, and 2 times a duration of the uplink control channel is less than or equal to a slot symbol length, the uplink control channel is transmitted repeatedly within a slot;

in a case where downlink control signaling indicates that a number of repetitions is 1 and a sum of a starting symbol position, a transmission interval, and 2 times a duration of the uplink control channel is greater than a slot symbol length, the uplink control channel is not transmitted repeatedly; or

in a case where a value of downlink control signaling is greater than or equal to 2, the uplink control channel is transmitted repeatedly between slots;

wherein the transmission interval is a symbol interval between two repeated transmissions of a PUCCH, the transmission interval is semi-statically indicated by a higher-layer parameter or dynamically indicated by downlink control signaling, and in a case where the transmission interval is not indicated, a value of the transmission interval is a set value.

~~19~~15. The method of claim 1, wherein in a case where the uplink control channel is configured with intra-slot frequency hopping and configured to be transmitted repeatedly within a slot, frequency hopping is performed within the uplink control channel; or in a case where the uplink control channel is configured with intra-slot frequency hopping and configured to be transmitted repeatedly within a slot, frequency hopping is performed between uplink control channels.

16~~20~~. The method of claim 1, wherein in a case where the uplink control channel is configured with intra-slot frequency hopping and configured to be transmitted repeatedly between slots, a unit of spatial relation matching is a frequency hopping unit or a slot.

~~21~~17. A configuration method, comprising:

determining transmission indication information, wherein the transmission indication information indicates a spatial relation associated with an uplink control channel during repeated transmissions of the uplink control channel; and

transmitting the transmission indication information.

~~22. The method of claim 21, wherein,~~

~~the transmission indication information comprises at least one of radio resource control (RRC) signaling, a media access control-control element, or downlink control information; and~~

~~the uplink control channel comprises a physical uplink control channel.~~

23. The method of claim 21, wherein,

at least one state is activated for a physical uplink control channel (PUCCH) resource and by a media access control control element included in the transmission indication information, and a PUCCH resource is for transmission of the uplink control channel indicated by downlink control information; or

group identification information is activated by a media access control control element included in the transmission indication information, and a PUCCH resource is for transmission of the uplink control channel indicated by downlink control information;

wherein the group identification information is identification information of a group formed by grouping higher layer parameters indicating spatial relations, and at least one spatial relation is included within the group.

24. The method of claim 21, wherein in a case where a number of the spatial relations associated with the uplink control channel is at least two and is configured with inter slot frequency hopping or no frequency hopping, a matching manner for spatial relations during the repeated transmission of the uplink control channel is determined according to an actual transmission occasion index.

25. The method of claim 21, wherein,

a starting spatial relation of the uplink control channel in a group comprising even slots is the same as a starting spatial relation of the uplink control channel in a group comprising odd slots, and spatial relations in each intra group are matched in a sequential order or in a cyclical order according to an actual transmission occasion index; or

a starting spatial relation of the uplink control channel in a group comprising even slots is different from a starting spatial relation of the uplink control channel in a group comprising odd slots, and spatial relations in each intra group are matched in a sequential order or in a cyclical order according to an actual transmission occasion index.

26. The method of claim 25, wherein in a case where the number of the spatial relation associated with the uplink control channel is two, the starting spatial relation of the uplink control channel in the group comprising even slots is the same as the starting spatial relation of the uplink control channel in the group comprising odd slots comprises:

~~the starting spatial relation of the uplink control channel in the group comprising even slots and the starting spatial relation of the uplink control channel in the group comprising odd slots are each a first spatial relation; or~~

~~the starting spatial relation of the uplink control channel in the group comprising even slots and the starting spatial relation of the uplink control channel in the group comprising odd slots are each a second spatial relation.~~

~~27. The method of claim 25, wherein in a case where a number of the spatial relation associated with the uplink control channel is two, the starting spatial relation of the uplink control channel in the group comprising even slots is different from the starting spatial relation of the uplink control channel in the group comprising odd slots comprises:~~

~~the starting spatial relation of the uplink control channel in the group comprising even slots is a first spatial relation, and the starting spatial relation of the uplink control channel in the group comprising odd slots is a second spatial relation; or~~

~~the starting spatial relation of the uplink control channel in the group comprising even slots is a second spatial relation, and the starting spatial relation of the uplink control channel in the group comprising odd slots is a first spatial relation.~~

~~28. The method of claim 25, wherein a number of transmissions of different spatial relations is the same, and the number of transmissions is a sum of a number of transmissions of a spatial relation in the group comprising even slots and a number of transmissions of the same spatial relation in the group comprising odd slots.~~

~~29. The method of claim 25, wherein in a case where the number of the repeated transmission associated with the uplink control channel is N+M and the number of the spatial relation associated with the uplink control channel is two, a number of transmissions of a first spatial relation in the group comprising even slots is $\lfloor N/2 \rfloor$, a number of transmissions of a second spatial relation in the group comprising even slots is $N-\lfloor N/2 \rfloor$, a number of transmissions of the first spatial relation in the group comprising odd slots is $M-\lfloor M/2 \rfloor$, and a number of transmissions of the second spatial relation in the group comprising odd slots is $\lfloor M/2 \rfloor$; and wherein a number of transmissions in even slots is N and a number of transmissions in odd slots~~

~~is M, and N and M are positive integers.~~

~~30. The method of claim 25, wherein in a case where the number of the repeated transmission associated with the uplink control channel is N+M and the number of the spatial relations associated with the uplink control channel is two, a number of transmissions of a first spatial relation in the group comprising even slots is $N-\lfloor N/2 \rfloor$, a number of transmissions of a second spatial relation in the group comprising even slots is $\lfloor N/2 \rfloor$, a number of transmissions of the first spatial relation in the group comprising odd slots is $\lfloor M/2 \rfloor$, and a number of transmissions of the second spatial relation in the group comprising odd slots is $M-\lfloor M/2 \rfloor$; and wherein a number of transmissions in even slots is N and a number of transmissions in odd slots is M, and N and M are positive integers.~~

~~31. The method of claim 21, wherein in a case where the uplink control channel is associated with at least two spatial relations and is configured with inter-slot frequency hopping or no frequency hopping, a matching manner of the spatial relations associated with the uplink control channel and a matching relationship of repeated transmissions is determined according to an absolute slot index.~~

~~32. The method of claim 31, wherein an even slot and an odd slot respectively correspond to different spatial relations associated with the uplink control channel.~~

~~33. The method of claim 32, wherein in a case where the number of the spatial relations associated with the uplink control channel is two, the even slot and the odd slot respectively correspond to different spatial relations associated with the uplink control channel comprises:~~

~~the even slot is associated with a first spatial relation, and the odd slot is associated with a second spatial relation; or~~

~~the even slot is associated with a second spatial relation, and the odd slot is associated with a first spatial relation.~~

~~34. The method of claim 31, wherein determining the spatial relations associated with the uplink control channel according to the absolute slot index comprises:~~

grouping transmission slots starting from a starting transmission slot, each group comprising M slots, and M being greater than or equal to 2; wherein,

an even-numbered group corresponds to a first spatial relation, and an odd-numbered group corresponds to a second spatial relation; or

an even-numbered group corresponds to a second spatial relation, and an odd-numbered group corresponds to a first spatial relation.

35. The method of claim 21, further comprising: semi-statically indicating a number of repetitions of the uplink control channel using a higher-layer parameter.

36. The method of claim 35, wherein the semi-statically indicating the number of repetitions of the uplink control channel using the higher-layer parameter comprises one of:

in a case where the uplink control channel is transmitted repeatedly within a slot, the higher-layer parameter indicates that a number of repetitions is 1, and a sum of a starting symbol position, a transmission interval, and 2 times a duration of the uplink control channel is less than or equal to a slot symbol length;

in a case where the uplink control channel is not transmitted repeatedly, the higher-layer parameter indicates that a number of repetitions is 1, and a sum of a starting symbol position, a transmission interval, and 2 times a duration of the uplink control channel is greater than a slot symbol length; or

in a case where the uplink control channel is transmitted repeatedly between slots, and the higher-layer parameter indicates that a number of repetitions is greater than or equal to 2;

wherein the transmission interval is a symbol interval between two repeated transmissions of a PUCCH, the transmission interval is semi-statically indicated by a higher-layer parameter or dynamically indicated by downlink control signaling, and in a case where the transmission interval is not indicated, a value of the transmission interval is a set value.

37. The method of claim 21, further comprising: dynamically indicating a number of repetitions of the uplink control channel using a higher-layer parameter and downlink control signaling.

38. The method of claim 37, wherein the dynamically indicating the number of repetitions of the

uplink control channel using the higher-layer parameter and the downlink control signaling comprises:

in a case where the higher-layer parameter indicates that the number of repetitions is 1 and the number of repetitions of the uplink control channel indicated by the downlink control signaling is 1, the uplink control channel is not transmitted repeatedly;

in a case where the higher-layer parameter indicates that the number of repetitions is 1 and the number of repetitions of the uplink control channel indicated by the downlink control signaling is 2, the uplink control channel is transmitted repeatedly within a slot; or

in a case where the higher-layer parameter indicates that the number of repetitions is not 1 or the number of repetitions of the uplink control channel indicated by the downlink control signaling is not 1 or 2, the uplink control channel is transmitted repeatedly between slots.

39. The method of claim 21, further comprising: dynamically indicating a number of repetitions of the uplink control channel using downlink control signaling.

40. The method of claim 39, wherein the dynamically indicating the number of repetitions of the uplink control channel using the downlink control signaling comprises:

in a case where the uplink control channel is transmitted repeatedly within a slot, the downlink control signaling indicates that the number of repetitions is 1, and a sum of a starting symbol position, a transmission interval, and 2 times a duration of the uplink control channel is less than or equal to a slot symbol length;

in a case where the uplink control channel is not transmitted repeatedly, the downlink control signaling indicates that the number of repetitions is 1, and a sum of a starting symbol position, a transmission interval, and 2 times a duration of the uplink control channel is greater than a slot symbol length; or

in a case where the uplink control channel is transmitted repeatedly between slots, a value of the downlink control signaling is greater than or equal to 2;

wherein the transmission interval is a symbol interval between two repeated transmissions of a PUCCH, the transmission interval is semi-statically indicated by a higher-layer parameter or

~~dynamically indicated by downlink control signaling, and in a case where the transmission interval is not indicated, a value of the transmission interval is a set value.~~

~~41. The method of claim 21, wherein in a case where the uplink control channel is configured with intra-slot frequency hopping and configured to be transmitted repeatedly within a slot, frequency hopping is performed within the uplink control channel; or in a case where the uplink control channel is configured with intra-slot frequency hopping and configured to be transmitted repeatedly within a slot, frequency hopping is performed between uplink control channels.~~

~~42. The method of claim 21, wherein in a case where the uplink control channel is configured with intra-slot frequency hopping and configured to be transmitted repeatedly between slots, a unit of spatial relation matching is a frequency hopping unit or a slot.~~

~~43~~18. A first communication node, comprising: at least one processor, wherein the at least one processor, when executed, implements the configuration method of any one of claims 1 to ~~20~~16.

~~44~~19. A second communication node, comprising: at least one processor, wherein the at least one processor, when executed, implements the configuration method of claim 17~~any one of claims 21 to 42~~.

~~45~~20. A storage medium storing a computer program which, when executed by a processor, causes the processor to perform the configuration method of any one of claims 1 to ~~42~~17.