For example, Patent Literature 1 and Patent Literature 2 disclose, as SPC or a technology equivalent to SPC, techniques for setting an amplitude (or power) that allows appropriate demodulation/decoding. Moreover, for example, Patent Literature 3 discloses a technique for enhancing successive interference cancellation (SIC) for reception of multiplexed signals.

Citation List

Patent Literature

[0005]

Patent Literature 1:	JP 2003-78419A
Patent Literature 2:	JP 2003-229835A
Patent Literature 3:	JP 2013-247513A

Disclosure of Invention

Technical Problem

[0006]

In signal processing technology using non-orthogonal resources such as SPC, improvements in decoding accuracy of a plurality of multiplexed signals on a reception device side are required. In this regard, embodiments of the present invention disclose a device, a method, and a program which are novel and improved and capable of further improving decoding accuracy in a case in which multiplexing/multiple-access using non-orthogonal resources is performed.

Solution to Problem

[0007]

According to a first aspect of the present invention, there is provided a device including: a processing unit configured to apply a second constellation corresponding to a symbol position of a first bit string in a first constellation applied to the first bit string, to a second bit string in regard to a plurality of bit strings to be multiplexed for each of transmission signal sequences to be multiplexed in resource blocks for which at least a part of frequency resources or time resources overlap, wherein the processing unit determines whether or not to apply the second constellation to the second bit string in accordance with content of signal processing at a stage after application of the first and the second constellations.

[0008]

According to a second aspect of the present invention, there is provided a method including: applying, by a processor, a second constellation corresponding to a symbol position of a first bit string in a first constellation applied to the first bit string, to a second bit string in regard to a plurality of bit strings to be multiplexed for each of transmission signal sequences to be multiplexed in resource blocks for which at least a part of frequency resources or time resources overlap, wherein the step of applying the second constellation determines whether or not to apply the second constellation to the second bit string in accordance with content of signal processing at a stage after application of the first and the second constellations.

[0009]

According to a third aspect of the present invention, there is provided a program causing a computer to function as: a processing unit configured to apply a second constellation corresponding to a symbol position of a first bit string in a first constellation applied to the first bit string, to a second bit string in regard to a plurality of bit strings to be multiplexed for each of transmission signal sequences to be multiplexed in resource blocks for which at least a part of frequency resources or time resources overlap, wherein the processing unit determines whether or not to apply the second constellation to the second bit string in accordance with content of signal processing at a stage after application of the first and the second constellations.

Advantageous Effects of Invention

[0010]

As described above, according to the present disclosure, it is possible to further improve decoding accuracy in a case in which multiplexing/multiple-access using non-orthogonal resources is performed. Note that the effects described above are not necessarily limitative. With or in the place of the above effects, there may be achieved any one of the effects described in this specification or other effects that may be grasped from this specification.

Brief Description of Drawings

[0011]

[FIG. 1] FIG. 1 is an explanatory diagram for explaining an example of a process in a transmission device that supports SPC.

[FIG. 2] FIG. 2 is an explanatory diagram for explaining an example of a process in a transmission device that supports SPC.

CLAIMS

1. A device, comprising:

a processing unit configured to apply a second constellation corresponding to a symbol position of a first bit string in a first constellation applied to the first bit string, to a second bit string in regard to a plurality of bit strings to be multiplexed for each of transmission signal sequences to be multiplexed in resource blocks for which at least a part of frequency resources or time resources overlap,

wherein the processing unit determines whether or not to apply the second constellation to the second bit string in accordance with content of signal processing at a stage after application of the first and the second constellations.

2. The device according to claim 1,

wherein bit strings corresponding to symbols of end portions in an adjacent direction of the respective second constellations corresponding to adjacent symbols in the first constellation, are identical.

3. The device according to claim 2,

wherein the second constellations corresponding to the adjacent symbols in the first constellation are constellations inverted in an adjacent direction.

4. The device according to claim 1,

wherein the transmission signal sequences are multiplexed using power allocation.

5. The device according to claim 4,

wherein a transmission signal sequence of the first bit string is higher in power to be allocated than a transmission signal sequence of the second bit string.

6. The device according to claim 1,

wherein the first and the second constellations indicate a gray-mapped correspondence relation between a bit string and a symbol on a complex plane.

7. The device according to claim 1,

wherein, in a case in which same transmission weighting is applied to both a transmission signal sequence of the first bit string and a transmission signal sequence of the second bit string or in a case in which transmission weighting is not applied to any of the transmission signal sequence of the first bit string and the transmission signal sequence of the second bit string, the processing unit applies the second constellation to the second bit string.

8. The device according to claim 1,

wherein, in a case in which a same transmission mode is applied to both a transmission signal sequence of the first bit string and a transmission signal sequence of the second bit string, the processing unit applies the second constellation to the second bit string.

9. The device according to claim 1,

wherein, in a case in which a spatial multiplexing process or a space diversity process of a same number of space multiplexings is applied to both a transmission signal sequence of the first bit string and a transmission signal sequence of the second bit string, the processing unit applies the second constellation to the second bit string.

10. The device according to claim 1,

wherein the processing unit determines whether or not to apply the second constellation to the second bit string in accordance with channels to be used for transmission of a transmission signal sequence of the first bit string and a transmission signal sequence of the second bit string.

11. The device according to claim 1,

wherein, in a case in which both a transmission signal sequence of the first bit string and a transmission signal sequence of the second bit string are transmitted using a data channel, a shared channel, or a dedicated channel, the processing unit applies the second constellation to the second bit string.

12. The device according to claim 1,

wherein, in a case in which a destination of a transmission signal sequence of the first bit string and a destination of a transmission signal sequence of the second bit string are a single device, the processing unit applies the second constellation to the second bit string.

13. The device according to claim 1,

wherein, in a case in which a destination of a transmission signal sequence of the first bit string and a destination of a transmission signal sequence of the second bit string are different, the processing unit applies the second constellation to the second bit string.

14. The device according to claim 1,

wherein a number of the transmission signal sequences to be multiplexed is 2.

15. The device according to claim 1,

wherein the second constellation further corresponds to a transmission weight applied to a transmission signal sequence of the first bit string and a transmission weight applied to a transmission signal sequence of the second bit string.

16. The device according to claim 15,

wherein the second constellation is obtained by rotating a reference constellation by an amount corresponding to the transmission weight applied to the transmission signal sequence of the first bit string, the transmission weight applied to the transmission signal sequence of the second bit string, and the symbol position of the first bit string in the first constellation applied to the first bit string.

17. The device according to claim 15,

wherein the transmission weight applied to the transmission signal sequence of the first bit string and the transmission weight applied to the transmission signal sequence of the second bit string are different.

18. A method, comprising:

applying, by a processor, a second constellation corresponding to a symbol position of a first bit string in a first constellation applied to the first bit string, to a second bit string in regard to a plurality of bit strings to be multiplexed for each of transmission signal sequences to be multiplexed in resource blocks for which at least a part of frequency resources or time resources overlap,

wherein the step of applying the second constellation determines whether or not to apply the second constellation to the second bit string in accordance with content of signal processing at a stage after application of the first and the second constellations.

19. A program causing a computer to function as:

a processing unit configured to apply a second constellation corresponding to a symbol position of a first bit string in a first constellation applied to the first bit string, to a second bit string in regard to a plurality of bit strings to be multiplexed for each of transmission signal sequences to be multiplexed in resource blocks for which at least a part of frequency resources or time resources overlap,

wherein the processing unit determines whether or not to apply the second constellation to the second bit string in accordance with content of signal processing at a stage after application of the first and the second constellations.