CLAIMS

What is claimed is:

1. A channel access method, wherein the method comprises:

receiving, by an access point AP, action information separately reported by N stations STAs, wherein N pieces of action information are used to determine a training result of a first neural network of each STA, and N is a positive integer;

determining, by the AP, the training result of the first neural network of each STA based on the N pieces of action information; and

sending, by the AP, the training result of the first neural network of each STA to the corresponding STA.

2. The method according to claim 1, wherein the action information indicates an action of a period of time, and the action is sending or skipping sending.

3. The method according to claim 1 or 2, wherein the method further comprises:

receiving, by the AP, carrier sense result information or packet transmission result information separately reported by the N STAs; and

the determining, by the AP, the training result of the first neural network of each STA based on the N pieces of action information comprises:

determining, by the AP, the training result of the first neural network of each STA based on the N pieces of action information and the N pieces of carrier sense result information; or

determining, by the AP, the training result of the first neural network of each STA based on the N pieces of action information and the N pieces of packet transmission result information.

4. The method according to any one of claims 1 to 3, wherein the training result is a neural network parameter or a gradient, and the neural network parameter/gradient is used by the STA to update the first neural network.

5. The method according to claim 1 or 2, wherein the action information is carried in an action details field of a first frame reported by the STA;

the action details field comprises a time indication subfield, and a data 1 subfield to a data T subfield, wherein T is a positive integer;

the time indication subfield indicates a moment at which the STA successfully receives first response information last time, and the first response information is response information sent when the AP successfully receives action information sent by the STA;

the data 1 subfield indicates an action performed in a first slot after the STA successfully receives the first response information last time; and

the data T subfield indicates an action performed in a Tth slot after the STA successfully

receives the first response information last time.

6. The method according to claim 1 or 2, wherein the action information is carried in an action details field of a first frame reported by the STA;

the action details field comprises a time indication subfield, an action 1 subfield, a time 1 subfield, ..., an action P subfield, and a time P subfield, wherein P is a positive integer;

the time indication subfield indicates a moment at which the STA successfully receives first response information last time, and the first response information is response information sent when the AP successfully receives action information sent by the STA;

the action 1 subfield indicates a first action after the STA successfully receives the first response information last time, and the time 1 subfield indicates duration of the action 1 or end time of the action 1; and

the action P subfield indicates a Pth action between a moment at which the STA successfully receives the first response information last time and a current moment, and the time P subfield indicates duration of the action P or end time of the action P.

7. The method according to claim 1 or 2, wherein the action information is carried in an action details field of a first frame reported by the STA;

the action details field comprises a time 1 indication subfield, an action 1 subfield, ..., a time P indication subfield, and an action P subfield, wherein P is a positive integer;

the time 1 indication subfield indicates start time of an action 1, the action 1 subfield indicates a first action after the STA successfully receives first response information last time, and the first response information is response information sent when the AP successfully receives action information sent by the STA; and

the time P indication subfield indicates start time of an action P, and the action P subfield indicates a Pth action between a moment at which the STA successfully receives the first response information last time and a current moment.

8. The method according to claim 1 or 2, wherein the action information is carried in an action details field of a first frame reported by the STA;

the action details field comprises a time 1 indication subfield, a duration 1 subfield, ..., a time K indication subfield, and a duration K subfield, wherein K is a positive integer;

the time 1 indication subfield indicates start time/end time of an action 1, the action 1 is a sending action when the STA sends a packet for the first time and does not receive second response information after successfully receiving first response information last time, the first response information is response information sent when the AP successfully receives action information sent by the STA, the second response information is response information sent when the AP successfully receives the packet sent by the STA, and the duration 1 subfield indicates duration of

the action 1; and

the time K indication subfield indicates start time/end time of an action K, the action K is a sending action when the STA sends a packet for the Kth time and does not receive the second response information after successfully receiving the first response information last time, and the duration K subfield indicates duration of the action K.

9. The method according to claim 1 or 2, wherein the action information is carried in an action details field of a first frame reported by the STA;

the action details field comprises a first time 1 indication subfield, a second time 1 indication subfield, ..., a first time K indication subfield, and a second time K indication subfield, wherein K is a positive integer;

the first time 1 indication subfield indicates start time of an action 1, the action 1 is a sending action when the STA sends a packet for the first time and does not receive second response information after successfully receiving first response information last time, the first response information is response information sent when the AP successfully receives action information sent by the STA, the second response information is response information sent when the AP successfully receives the packet sent by the STA, and the second time 1 indication subfield indicates end time of the action 1; and

the first time K indication subfield indicates start time of an action K, the action K is a sending action when the STA sends a packet for the Kth time and does not receive the second response information after successfully receiving the first response information last time, and the second time K indication subfield indicates end time of the action K.

10. The method according to claim 3, wherein the action information and the carrier sense result information are carried in an action details field of a first frame reported by the STA;

the action details field comprises a time indication subfield, and a data 1 subfield to a data T subfield, wherein T is a positive integer;

the time indication subfield indicates a moment at which the STA successfully receives first response information last time, and the first response information is response information sent when the AP successfully receives action information sent by the STA;

the data 1 subfield indicates a carrier sense result and an action performed in a first slot after the STA successfully receives the first response information last time; and

the data T subfield indicates a carrier sense result and an action performed in a Tth slot after the STA successfully receives the first response information last time.

11. The method according to claim 3, wherein the action information and the packet transmission result information are carried in an action details field of a first frame reported by the STA;

the action details field comprises a time indication subfield, and a data 1 subfield to a data T subfield, wherein T is a positive integer;

the time indication subfield indicates a moment at which the STA successfully receives first response information last time, and the first response information is response information sent when the AP successfully receives action information sent by the STA;

the data 1 subfield indicates a packet transmission result and an action performed in a first slot after the STA successfully receives the first response information last time; and

the data T subfield indicates a packet transmission result and an action performed in a Tth slot after the STA successfully receives the first response information last time.

12. The method according to any one of claims 1 to 11, wherein the determining, by the AP, the training result of the first neural network of each STA based on the N pieces of action information comprises:

inputting, by the AP, status information of each STA into the first neural network of the corresponding STA, to obtain an output of the first neural network;

inputting, by the AP, the output of each first neural network into a second neural network, to obtain an output of the second neural network, wherein the output of the second neural network represents an expected reward within preset time; and

training, by the AP, a third neural network based on the output of the second neural network and a reward function, and determining the training result of each first neural network by minimizing a loss function of the third neural network, wherein the third neural network comprises each first neural network and the second neural network; and

the status information of the STA is obtained based on the action information of the STA, a neural network parameter of the second neural network is obtained based on the N pieces of action information, and the reward function is determined based on the N pieces of action information;

the status information of the STA is obtained based on the action information and the carrier sense result information of the STA, a neural network parameter of the second neural network is obtained based on the N pieces of action information and the N pieces of carrier sense result information, and the reward function is determined based on the N pieces of action information and the N pieces of carrier sense result information; or

the status information of the STA is obtained based on the action information and the packet transmission result information of the STA, a neural network parameter of the second neural network is obtained based on the N pieces of action information and the N pieces of packet transmission result information, and the reward function is determined based on the N pieces of action information and the N pieces of packet transmission result information.

13. The method according to claim 12, wherein the method further comprises:

when determining, based on the N pieces of action information, that a first STA successfully sends a packet, setting, by the AP, a value of the reward function to 1, wherein the first STA is a STA in the N STAs that has a longest time interval between a moment at which the second response information is successfully received last time and the current moment.

14. The method according to claim 12, wherein the method further comprises:

when determining, based on the N pieces of action information, that a second STA successfully sends a packet, setting, by the AP, a value of the reward function to first duration minus 1, wherein

the second STA is a STA other than a first STA in the N STAs, and the first STA is a STA in the N STAs that has a longest time interval between a moment at which the second response information is successfully received last time and the current moment; and

the first duration is duration between a moment at which the second STA successfully receives the second response information last time and the current moment.

15. The method according to claim 12, wherein the method further comprises:

when determining, based on the N pieces of action information, that M STAs in the N STAs send packets in a same slot, setting, by the AP, a value of the reward function to –1, wherein M is a positive integer less than or equal to N.

16. The method according to claim 12, wherein the method further comprises:

when determining, based on the N pieces of action information, that none of the N STAs sends a packet in a same slot, setting, by the AP, a value of the reward function to 0.

17. The method according to any one of claims 1 to 16, wherein the N STAs share a neural network parameter, and the sending, by the AP, the training result of the first neural network of each STA to the corresponding STA comprises:

broadcasting, by the AP, the training result of the first neural network to the N STAs.

18. The method according to any one of claims 1 to 16, wherein S STAs in the N STAs share a neural network parameter, S is a positive integer less than or equal to N, and the sending, by the AP, the training result of the first neural network of each STA to the corresponding STA comprises:

multicasting, by the AP, the training results of the first neural networks corresponding to the S STAs to the S STAs, and unicasting the training results of the (N–S) first neural networks to the corresponding STAs.

19. The method according to any one of claims 1 to 16, wherein

when the N STAs do not share a neural network parameter, the training result of each first neural network is unicast to the corresponding STA.

20. A channel access method, wherein the method comprises:

reporting, by a station STA, action information to an access point AP, wherein the action

information is used to determine a training result of a first neural network of the STA;

receiving, by the STA, the training result of the first neural network from the AP, wherein the training result of the first neural network is used to update the first neural network, to determine whether the STA accesses a channel; and

updating, by the STA, the first neural network based on the training result of the first neural network, and when sensing that the channel is idle, determining, based on an updated first neural network and current status information of the STA, whether to access the channel.

21. The method according to claim 20, wherein the action information indicates an action of a period of time, and the action is sending or skipping sending.

22. The method according to claim 20 or 21, wherein the method further comprises:

reporting, by the STA, carrier sense result information or packet transmission result information to the AP, wherein the carrier sense result information or the packet transmission result information is used to determine the training result of the first neural network of the STA.

23. The method according to any one of claims 20 to 22, wherein the training result is a neural network parameter or a gradient; and

the neural network parameter/gradient is used by the STA to update the first neural network.

24. The method according to claim 20 or 21, wherein the action information is carried in an action details field of a first frame reported by the STA;

the action details field comprises a time indication subfield, and a data 1 subfield to a data T subfield, wherein T is a positive integer;

the time indication subfield indicates a moment at which the STA successfully receives first response information last time, and the first response information is response information sent when the AP successfully receives action information sent by the STA;

the data 1 subfield indicates an action performed in a first slot after the STA successfully receives the first response information last time; and

the data T subfield indicates an action performed in a Tth slot after the STA successfully receives the first response information last time.

25. The method according to claim 20 or 21, wherein the action information is carried in an action details field of a first frame reported by the STA;

the action details field comprises a time indication subfield, an action 1 subfield, a time 1 subfield, ..., an action P subfield, and a time P subfield, wherein P is a positive integer;

the time indication subfield indicates a moment at which the STA successfully receives first response information last time, and the first response information is response information sent when the AP successfully receives action information sent by the STA;

the action 1 subfield indicates a first action after the STA successfully receives the first

response information last time, and the time 1 subfield indicates duration of the action 1 or end time of the action 1; and

the action P subfield indicates a Pth action between a moment at which the STA successfully receives the first response information last time and a current moment, and the time P subfield indicates duration of the action P or end time of the action P.

26. The method according to claim 20 or 21, wherein the action information is carried in an action details field of a first frame reported by the STA;

the action details field comprises a time 1 indication subfield, an action 1 subfield, ..., a time P indication subfield, and an action P subfield, wherein P is a positive integer;

the time 1 indication subfield indicates start time of an action 1, the action 1 subfield indicates a first action after the STA successfully receives first response information last time, and the first response information is response information sent when the AP successfully receives action information sent by the STA; and

the time P indication subfield indicates start time of an action P, and the action P subfield indicates a Pth action between a moment at which the STA successfully receives the first response information last time and a current moment.

27. The method according to claim 20 or 21, wherein the action information is carried in an action details field of a first frame reported by the STA;

the action details field comprises a time 1 indication subfield, a duration 1 subfield, ..., a time K indication subfield, and a duration K subfield, wherein K is a positive integer;

the time 1 indication subfield indicates start time/end time of an action 1, the action 1 is a sending action when the STA sends a packet for the first time and does not receive second response information after successfully receiving first response information last time, the first response information is response information sent when the AP successfully receives action information sent by the STA, the second response information is response information sent when the AP successfully receives the packet sent by the STA, and the duration 1 subfield indicates duration of the action 1; and

the time K indication subfield indicates start time/end time of an action K, the action K is a sending action when the STA sends a packet for the Kth time and does not receive the second response information after successfully receiving the first response information last time, and the duration K subfield indicates duration of the action K.

28. The method according to claim 20 or 21, wherein the action information is carried in an action details field of a first frame reported by the STA;

the action details field comprises a first time 1 indication subfield, a second time 1 indication subfield, ..., a first time K indication subfield, and a second time K indication subfield, wherein K

is a positive integer;

the first time 1 indication subfield indicates start time of an action 1, the action 1 is a sending action when the STA sends a packet for the first time and does not receive second response information after successfully receiving first response information last time, the first response information is response information sent when the AP successfully receives action information sent by the STA, the second response information is response information sent when the AP successfully receives the packet sent by the STA, and the second time 1 indication subfield indicates end time of the action 1; and

the first time K indication subfield indicates start time of an action K, the action K is a sending action when the STA sends a packet for the Kth time and does not receive the second response information after successfully receiving the first response information last time, and the second time K indication subfield indicates end time of the action K.

29. The method according to claim 22, wherein the action information and the carrier sense result information are carried in an action details field of a first frame reported by the STA;

the action details field comprises a time indication subfield, and a data 1 subfield to a data T subfield, wherein T is a positive integer;

the time indication subfield indicates a moment at which the STA successfully receives first response information last time, and the first response information is response information sent when the AP successfully receives action information sent by the STA;

the data 1 subfield indicates a carrier sense result and an action performed in a first slot after the STA successfully receives the first response information last time; and

the data T subfield indicates a carrier sense result and an action performed in a Tth slot after the STA successfully receives the first response information last time.

30. The method according to claim 22, wherein the action information and the packet transmission result information are carried in an action details field of a first frame reported by the STA;

the action details field comprises a time indication subfield, and a data 1 subfield to a data T subfield, wherein T is a positive integer;

the time indication subfield indicates a moment at which the STA successfully receives first response information last time, and the first response information is response information sent when the AP successfully receives action information sent by the STA;

the data 1 subfield indicates a packet transmission result and an action performed in a first slot after the STA successfully receives the first response information last time; and

the data T subfield indicates a packet transmission result and an action performed in a Tth slot after the STA successfully receives the first response information last time.

31. The method according to any one of claims 20 to 30, wherein the updating, by the STA, the first neural network based on the training result of the first neural network, and when sensing that the channel is idle, determining, based on an updated first neural network and current status information of the STA, whether to access the channel comprises:

inputting, by the STA, the current status information of the STA into the updated first neural network, to output a first value and a second value, wherein the first value represents an expected reward obtained by accessing the channel, and the second value represents an expected reward obtained by skipping accessing the channel; and

when the first value is greater than the second value, determining, by the STA, to access the channel; or

when the first value is less than the second value, determining, by the STA, to skip accessing the channel.

32. A communication apparatus, configured to perform a method as claimed in any one of claims 1 to 19, or a method as claimed in any one of claims 20 to 31.

33. A communication apparatus, comprising a processor and a transceiver, wherein the transceiver is configured to communicate with another communication apparatus, and the processor is configured to run a program, so that the communication apparatus implements the method according to any one of claims 1 to 19, or the communication apparatus implements the method according to any one of claims 20 to 31.

34. A computer-readable storage medium, wherein the computer-readable storage medium stores instructions, and when the instructions are run on a computer, the method according to any one of claims 1 to 19 is performed, or the method according to any one of claims 20 to 31 is performed.

35. A computer program product comprising instructions, wherein when the computer program product runs on a computer, the method according to any one of claims 1 to 19 is performed, or the method according to any one of claims 20 to 31 is performed.