CLAIMS

1. A method of switching states of a card game, comprising:

obtaining card information comprising position information of at least one card involved in a live image of a current card game from a card detection on the live image, wherein the live image is acquired from a game tabletop for proceeding the current card game, and the game tabletop comprises two or more placement areas for placing a card;

determining, in response to that the at least one card is excluded from one or more recorded cards of the current card game, that the at least one card is a target card, wherein the one or more recorded cards comprise each card detected in the current card game;

wherein pre-acquired recorded card information comprising recorded card position information, determining, in response to that the at least one card is excluded from the one or more recorded cards of the current card game, that the at least one card is the target card comprises:

determining, in response to that position information of the at least one card is excluded from the recorded card position information, that the at least one card is a candidate card;

for each of a plurality of consecutive subsequent images of the live image, obtaining card information and card operator information from the subsequent image by performing a detection of card and card operator on the subsequent image, wherein the card information comprises a boundary box indicating position information of a card; the card operator information comprises a boundary box indicating position information of a card operator; and

determining the candidate card as the target card in response to determining, based on the respective card information and card operator information, that a boundary box of the candidate card does not overlap with a boundary box of the card operator in each of the plurality of consecutive subsequent images;

determining, according to the recorded card information and card sequential configuration information of the current card game, an expected placement area for the target card from the two or more placement areas, wherein the card sequential configuration information is used to define a placement area for a card dealt in the current card game;

updating, in response to position information of the target card indicating that the target card is not placed in the expected placement area, the current card game to a halt state; and

updating the recorded card information by storing card information of the target card.

2. The method according to claim 1, further comprising:

obtaining a face state of the target card from a face state detection on the target card; and

updating, in response to that a number of dealt cards in the current card game is less than or equal to a predetermined threshold and the face state of the target card does not match a first face state, the current card game to the halt state;

wherein the dealt cards comprise the one or more recorded cards and the target card,

the first face state indicates an expected face state for a card in a dealing phase, which is determined from game type configuration information of the current card game.

3. The method according to claim 2, wherein

the two or more placement areas comprise a first placement area to place a card for an operator of a target game operation and a second placement area to place a card for a non-operator;

based on the card detection performed on the live image, first card information of cards within the first placement area and second card information of cards within the second placement area are further obtained;

when the game type configuration information of the current card game indicates the current card game is of a first type, the method further comprising:

updating, in response to that the first card information and the second card information do not meet a card information condition for the target game operation, the current card game to the halt state.

4. The method according to claim 3, wherein

the first card information comprises

a number of cards within the first placement area obtained from the card detection on a first live image as a first card number, and

a number of cards within the first placement area obtained from the card detection on a second live image captured later than the first live image in time sequence as a new first card number;

the second card information comprises

a number of cards within the second placement area obtained from the card detection on the first live image as a second card number, and

a number of cards within the second placement area obtained from the card detection on the second live image as a new second card number;

the first card information and the second card information do not meet the card information condition for the target game operation, comprises:

the first card number equals to a first number while the second card number equals to a second number; and

the new first card number also equals to the first number while the new second card number is less than the second number.

5. The method according to claim 3, wherein

the first card information comprises

a number of cards within the first placement area obtained from the card detection on a first live image as a first card number, and

a number of cards within the first placement area obtained from the card detection on a second live image captured later than the first live image in time sequence as a new first card number;

the second card information comprises

a number of cards within the second placement area obtained from the card detection on the first live image as a second card number, and

face states of cards within the second placement area obtained from the card detection on the second live image;

the first card information and the second card information do not meet the card information condition for the target game operation, comprises:

the first card number equals to a first number while the second card number equals to a second number; and

the new first card number also equals to the first number while the face states of cards within the second placement area comprise a visible state.

6. The method according to claim 3, wherein

the game tabletop further comprising a predetermined operating area for the target game operation;

the first card information comprises an actual number of cards within the first placement area;

the second card information comprises an actual number of cards within the second placement area;

based on the card detection performed on the live image, an actual number of cards within the predetermined operating area is further obtained;

the first card information and the second card information do not meet the card information condition for the target game operation, comprises at least one of:

the actual number of cards within the first placement area does not match a target number of cards for the first placement area;

the actual number of cards within the second placement area does not match a target number of cards for the second placement area; or

the actual number of cards within the predetermined operating area does not match a target number of cards for the predetermined operating area.

7. The method according to claim 1, wherein the card sequential configuration information comprises a correspondence between placement areas and serial positions of cards dealt in the current card game; determining, according to the pre-acquired recorded card information and the card sequential configuration information of the current card game, the expected placement area for the target card from the two or more placement areas comprises:

determining, in response to that a number of recorded cards determined based on the recorded card information does not exceed a predetermined threshold, a serial position of the target card based on the number of recorded cards; and

determining, based on the correspondence comprised in the card sequential configuration information, the expected placement area corresponding to the serial position of the target card from the two or more placement areas.

8. The method according to claim 1, the recorded card information comprising recorded card face values; the card sequential configuration information comprises an association relationship between recorded card face values and a placement area for the target card; determining, according to the pre-acquired recorded card information and the card

sequential configuration information of the current card game, the expected placement area for the target card from the two or more placement areas comprises:

obtaining, in response to that a number of recorded cards determined based on the recorded card information is greater than a predetermined threshold, the recorded card face values comprised in the recorded card information; and

determining, based on the association relationship comprised in the card sequential configuration information, the expected placement area associated with the recorded card face values from the two or more placement areas.

9. The method according to claim 1, the recorded card information further comprising recorded card face states; the method further comprising:

obtaining, when determining that the at least one card is the target card and a number of recorded cards determined based on the recorded card information is greater than or equal to a predetermined threshold, the recorded card face states comprised in the recorded card information; and

updating, in response to that the recorded card face states comprises a face state other than a second face state while the second face state is expected for a recorded card when dealing the target card, the current card game to the halt state.

10. The method according to any one of claims 1 to 9, wherein determining, in response to that the at least one card is excluded from the one or more recorded cards of the current card game, that the at least one card is the target card further comprises:

determining the candidate card as the target card in response to that a position of the candidate card indicating by the boundary box of the candidate card is not changed in the plurality of consecutive subsequent images.

11. The method according to claim 1, wherein the card information of the target card comprises at least one of:

position information indicated by a boundary box of the target card; or

attribute information of the target card, wherein the attribute information comprises at least one of a face value or a face state, and the face state comprises a visible state or a hidden state.

12. An apparatus for switching states of a card game, comprising:

a card detecting module, configured to obtain card information comprising position information of at least one card involved in a live image of a current card game from a card detection on the live image, wherein the live image is acquired from a game tabletop for proceeding the current card game, and the game tabletop comprises two or more placement areas for placing a card;

a target card determining module, configured to determine, in response to that the at least one card is excluded from one or more recorded cards of the current card game, that the at least one card is a target card, wherein the one or more recorded cards comprise each card detected in the current card game;

wherein pre-acquired recorded card information comprising recorded card position information, the target card determining module is specially configured to:

determine, in response to that position information of the at least one card is excluded from the recorded card position information, that the at least one card is a candidate card;

for each of a plurality of consecutive subsequent images of the live image, obtain card information and card operator information from the subsequent image by performing a detection of card and card operator on the subsequent image, wherein the card information comprises a boundary box indicating position information of a card; the card operator information comprises a boundary box indicating position information of a card operator; and

determine the candidate card as the target card in response to determining, based on the respective card information and card operator information, that a boundary box of the candidate card does not overlap with a boundary box of the card operator in each of the plurality of consecutive subsequent images;

an expected placement area determining module, configured to determine, according to the recorded card information and card sequential configuration information of the current card game, an expected placement area for the target card from the two or more placement areas, wherein the card sequential configuration information is used to define a placement area for a card dealt in the current card game;

a first updating module, configured to update, in response to position information of the target card indicating that the target card is not placed in the expected placement area, the current card game to a halt state; and

a cache updating module, configure to update the recorded card information by storing card information of the target card.

13. The apparatus according to claim 12, the apparatus further comprising:

a first detecting module for a face state, configured to obtain a face state of the target card from a face state detection on the target card;

a second updating module, configured to update, in response to that a number of dealt cards in the current card game is less than or equal to a predetermined threshold and the face state of the target card does not match a first face state, the current card game to the halt state;

wherein the dealt cards comprise the one or more recorded cards and the target card, the first face state indicates an expected face state for a card in a dealing phase, which is determined from game type configuration information of the current card game.

14. The apparatus according to claim 13, wherein the two or more placement areas comprise a first placement area to place a card for an operator of a target game operation and a second placement area to place a card for a non-operator;

the card detecting module is further configured to obtain, based on the card detection performed on the live image, first card information of cards within the first placement area and second card information of cards within the second placement area; and

the apparatus further comprising:

a third updating module, configured to update, in response to that the first card information and the second card information do not meet a card information condition for the target game operation, the current card game to the halt state when the game type configuration information of the current card game indicates the current card game is of a first type.

15. The apparatus according to any one of claims 12 to 14, wherein the target card determining module is further specially configured to:

determine the candidate card as the target card in response to that a position of the candidate card indicating by the boundary box of the candidate card is not changed in the plurality of consecutive subsequent images.

16. The apparatus according to claim 15, wherein the card information of the target card comprises at least one of:

position information indicated by a boundary box of the target card; or

attribute information of the target card, wherein the attribute information comprises at least one of a face value or a face state, and the face state comprises a visible state or a hidden state.

17. An electronic device, comprising:

a processor, and

a memory for storing computer instructions that can be read by the processor;

wherein, by executing the computer instructions, the processor is caused to implement the method of switching states of a card game according to any one of claims 1 to 11.

18. A non-transitory computer readable storage medium, storing computer readable instructions for causing a computer to perform the method of switching states of a card game according to any one of claims 1 to 11.