[0007]

Furthermore, fraud on a game table is so sophisticated that it is not possible to find, for example, fraud made in a sophisticated way of betting by, for example, simply detecting that the amount won on a certain game table is large with a camera, thus posing a new problem.

[0008]

Moreover, a dealer needs to collect game tokens and distribute game tokens as a reward placed on a game table according to win-loss results. Assume that this operation is determined by image analysis. In this case, because each game token (chip) has a complex design, it is not possible with any existing practical image analysis technique to determine whether the dealer has performed correct distribution for a reward when distributing chips as a reward corresponding to bet chips, thus resulting in the problem of insufficient prevention of mishandling.

Solution to Problem

[0008a]

An aspect of the present invention provides a system for determining a value of each of one or more game tokens forming one or more stacks, wherein the game token has a notation representing the value on its flat surface and has a first color portion representing the value in color and a second color portion not representing the value on its side, the first color portion and second color portion forming a stripe pattern on a side surface of the game token in a stacking direction, the system comprising a camera that captures an image of the one or more game tokens that form one or more stacks; and one or more processors, which use deep learning techniques to analyze one image captured by the camera in which one or more of the first

color portions and one or more of the second color portions appear; detect the first color portions from the one image; identify, based on the color of one or more of the detected first color portions in the image, the value of one or more game tokens forming one or more stacks in the image; identify the one or more stacks in a predetermined target area; and identify a total value of the one or more game tokens for each of the one or more stacks based on the value and number of the one or more game tokens forming the one or more stacks.

[0009]

A table game management system as disclosed includes a card distributor that determines and displays a win-loss result on each game on a game table, a measurement device that measures types and number of game tokens

CLAIMS

1. A system for determining a value of each of one or more game tokens forming one or more stacks, wherein the game token has a notation representing the value on its flat surface and has a first color portion representing the value in color and a second color portion not representing the value on its side, the first color portion and second color portion forming a stripe pattern on a side surface of the game token in a stacking direction,

the system comprising:

a camera that captures an image of the one or more game tokens that form one or more stacks; and

one or more processors, which use deep learning techniques to:

analyze one image captured by the camera in which one or more of the first color portions and one or more of the second color portions appear;

detect the first color portions from the one image;

identify, based on the color of one or more of the detected first color portions in the image, the value of one or more game tokens forming one or more stacks in the image;

identify the one or more stacks in a

predetermined target area; and

identify a total value of the one or more game tokens for each of the one or more stacks based on the value and number of the one or more game tokens forming the one or more stacks.

2. The system according to claim 1, wherein the one or more processors extracts the first color portion from the image and identifies the value of the game token based on the color of the extracted first color portion.

3. The system according to claim 1, wherein the game token has a pattern on its side in which at least a portion of the first color portion is sandwiched between other color portions.

4. The system according to claim 2, wherein the one or more processors identifies the number of the one or more game tokens according to the number of the first color portions extracted.

5. The system according to claim 1, wherein the game token has information that can identify the value other than the notation and the first color portion.

6. The system according to any of claims 1 to 5, wherein the one or more processors inspect whether each of the values identified by each of a plurality of methods from the game token matches each other.

7. The system according to claim 6, wherein the one or more processors inspect whether the value represented by the notation matches the value identified based on the first color portion.

8. The system according to any of claims 5 to 7, wherein the information is stored in the RFID embedded in the game token.

9. The system according to claim 8, further comprising a reader that reads the RFID.