

Information Processing Device, Gaming Device, and Gaming System

Technical Field

[0001]

The present invention relates to an information processing device, gaming device, and gaming system.

Background Technology

[0002]

Conventionally, a so-called online game has been played, where a plurality of players play a game match by operating gaming devices using a server and a plurality of gaming devices connected via a network. In order to prevent player fraud or the like in such an online game, the plurality of gaming devices that are playing a match mutually transmit a video (including images) generated by imaging the player, and the gaming devices display the video received from an opponent gaming device.

[0003]

In the gaming device, when a failure is present in a series of functions for generating a video and then transmitting the video to an opponent gaming device, preventing a player from being fraudulent is difficult to achieve. In this regard, a security camera imaging system described in Patent Document 1 can be considered as means for detecting failure in a video transmission function for example. Patent Document 1 discloses a security camera imaging system that generates a warning or the like for an abnormality occurrence when a monitoring system detects a loss in a synchronization signal when a video image signal is interrupted.

Prior Technology Documents

Patent Documents

[0004]

Patent Document: JP 2000-194969 A

Summary of the Invention

Problem to be Solved by the Invention

[0005]

However, if the video image signal is interrupted and immediately determined to be abnormal, it is difficult to distinguish between cases where failure occurs in video transmission due to a mere transient communication failure or the like, and cases where failure occurs in a video transmission function of a gaming device.

[0006]

In view of the foregoing, an object of the present invention is to provide an information processing device that can improve accuracy of detecting a failure in a video transmission function of a gaming device.

Means for Solving Problems

[0007]

An information processing device according to the present invention is an information processing device that provides an online gaming service via a communication network to a plurality of gaming devices, where the plurality of gaming devices each contain: an imaging part that images a periphery of the gaming device to generate a first video; a first video transmitting part that transmits the first video to an opponent gaming device; a second video receiving part receives a second video generated by imaging a periphery of the opponent gaming device from the opponent gaming device; a displaying part; a second video display processing part that displays the second video on the displaying part; a reception time calculating part that calculates a reception time, which is a cumulative time when the second video receiving part receives the second video from the opponent gaming device during a calculation period; and a received information transmitting part that transmits received information based on the time required for the calculation period, the reception time, identification information of the gaming device, and identification information of the opponent gaming device to the information processing device, and the information processing device contains: a storing part; a video transmission success rate acquiring part that acquires a

ratio of the reception time to the time required for the calculation period as a video transmission success rate indicating a video transmission status by the opponent gaming device, based on the received information received from the plurality of gaming devices; a storage processing part that stores the acquired video transmission success rate in the storing part in association with the identification information of the gaming device on a video transmitting side and the identification information of the gaming device on the video receiving side; and a limiting part that determines whether or not a predetermined transmission failure condition is satisfied for a plurality of video transmission success rates stored in the storing part in association with one gaming device with the one gaming device set as the video transmitting side, and limits provision of the online gaming service to the gaming device when the predetermined transmission failure condition is satisfied.

Effect of the Invention

[0008]

The present invention can provide an information processing device that can improve accuracy of detecting a failure in a video transmission function of a gaming device.

Brief Description of the Drawings

[0009]

FIG. 1 is a network configuration diagram illustrating an example of a gaming system 1 according to a first embodiment of the present invention.

FIG. 2 is a schematic external view of a gaming device 20.

FIG. 3 is a block diagram illustrating a functional configuration of the gaming device 20.

FIG. 4 is a block diagram illustrating a functional configuration of a server 10.

FIG. 5 is a diagram showing an example of a video transmission success rate table.

FIG. 6 is a diagram for describing a transmission failure condition.

FIG. 7 is a diagram showing an example of an operation sequence related to a matching process, a game advancing process, and a received information storing process based on the gaming system 1.

FIG. 8 is a diagram illustrating an example of a game screen.

FIG. 9 is a diagram showing an example of an operation flow related to a video transmitting process based on the gaming device 20.

Description of the Preferred Embodiments

[0010]

Various embodiments of the present invention will be described below while referring to the drawings. However, a technical scope of the present invention is not limited to the embodiments, but extends to an invention described in the scope of the claims and equivalents thereof.

[0011]

(1) Configuration of Gaming System 1

FIG. 1 is a network configuration diagram illustrating an example of a gaming system 1. A gaming system 1 is a system for executing a darts game as an example of an online game. The gaming system 1 has a server 10 and a plurality of gaming devices 20, which are mutually connected by a communication network 2 such as the Internet or the like. The plurality of gaming devices 20 may be, for example, installed in separate stores, or may be installed in the same store.

[0012]

(2) Configuration of Each Device

(2-1) Configuration of Gaming Device 20

FIG. 2 is a schematic external view of the gaming device 20. FIG. 3 is a block diagram illustrating a functional configuration of the gaming device 20. The gaming device 20 is a gaming device for a player to perform a darts game. The gaming device 20 is provided with a gaming device communicating part 21, a gaming device storing part 22, an operating part 23, a displaying part 24, a card slot CS, a card RW part 25, a dartboard DB, a detecting part 26, a coin insertion part 27, an imaging part 28, and a gaming device processing part 29. In the

darts game, a player launches a dart at the dartboard DB from a field appropriately set in front of the gaming device 20.

[0013]

The gaming device communicating part 21 is provided with a communication interface circuit for connecting the gaming device 20 to the communication network 2, and communicates with the communication network 2. The gaming device communicating part 21 supplies data received from the server 10, another gaming device 20, and the like to the gaming device processing part 29 via the communication network 2. Furthermore, the gaming device communicating part 21 transmits data supplied from the gaming device processing part 29 to the server 10, the other gaming device 20, and the like through the communication network 2.

[0014]

The gaming device storing part 22 is provided with at least one of a magnetic tape device, magnetic disk device, or optical disk device. The gaming device storing part 22 stores an operating system program, driver program, application program, data, and the like used for processing in the gaming device processing part 29. For example, the gaming device storing part 22 stores a program for advancing the darts game or the like as an application program. Furthermore, for example, the gaming device storing part 22 stores a video received from the other gaming device 20 via the communication network 2 or the like. A computer program may be installed in the gaming device storing part 22 using a conventionally known setup program or the like from a portable computer-readable recording medium such as a CD-ROM, DVD-ROM, or the like for example. Alternatively, the computer program may be installed in the gaming device storing part 22 by downloading from the server 10 or another information processing device via the communication network 2 or the like.

[0015]

Furthermore, the operating part 23 is for a player to perform various operations, and is implemented by an operating button or the like provided on an operating panel for example. The operating part 23 receives an operation by the player and transmits a signal based on the operation to the gaming device processing part 29 or the like.

[0016]

The displaying part 24 may be any device so long as an image, video image, or the like can be displayed, and examples include liquid crystal displays, organic EL (Electro-Luminescence) displays, and the like. The displaying part 24 may be integrated with the operating part 23 by a liquid crystal touch panel display for example. The displaying part 24 displays an image or video based on data supplied from the gaming device processing part 29.

[0017]

The card slot CS is an insertion port for inserting a game card owned by the player. Four card slots CS are provided in the gaming device 20 such that a maximum of four players can play a game. Note that over four card slots CS may be provided such that more than four players can play a game.

[0018]

The card RW part 25 can read a card ID or the like recorded in the game card owned by the player, or write information or the like obtained as a result of a game in the game card.

[0019]

The dartboard DB is a board surface serving as a target of the darts game. The dartboard DB is demarcated into a plurality of target areas, and a plurality of fine holes are provided in the target areas. A tip end portion of a dart launched by a player is received in one of the plurality of holes provided in the target area.

[0020]

The detecting part 26 has: a membrane switch provided corresponding to each target area to detect that the dart has stuck into the target area; and a vibration sensor provided to detect that the launched dart has deviated from the target area. The detecting part 26 detects whether or not the dart has stuck into the target area based on a signal by the membrane switch and vibration sensor, and then transmits the detected signal to the gaming device processing part 29.

[0021]

The coin insertion part 27 is provided with an insertion port for inserting a coin and a sensor for detecting a coin inserted from the insertion port. In the gaming device 20, gameplay is made possible by a player inserting a predetermined number of coins from the coin insertion port. Note that in the gaming device 20, gameplay may be made possible without inserting a coin from the coin insertion port.

[0022]

The imaging part 28 is configured from a video camera or the like for example. The imaging part 28 generates a video by imaging a periphery of the gaming device 20 and then outputs to the gaming device processing part 29. Herein, “video” refers to at least one image that is continuous in time series, and is used as including one image. The imaging part 28 images, for example, a player, a darts game field, the gaming device 20, and the like as a periphery of the gaming device 20. The imaging part 28 may perform imaging while zooming or panning by controlling by the gaming device processing part 29.

[0023]

The gaming device processing part 29 is provided with one or a plurality of processors and peripheral circuitry thereof. The gaming device processing part 29 is, for example, a CPU, which comprehensively controls an overall operation of the gaming device 20. The gaming device processing part 29 controls an operation of the gaming device communicating part 21 or the like such that various processes of the gaming device 20 are executed by an appropriate procedure based on a program or the like stored in the gaming device storing part 22.

[0024]

The gaming device processing part 29 is provided with a matching requesting part 291, a game advancing part 292, an opponent video receiving part 293, a reception time calculating part 294, a display processing part 295, an automatic image transmitting part 296, and a received information transmitting part 297. The matching requesting part 291 transmits a matching request from a player received by the gaming device 20 to the server 10 via the communication network 2 for example. The game advancing part 292 executes a process related to advancing the darts game for example. The opponent video receiving part 293 is an example of a second video receiving part, and for example, receives a video (second video)

generated by imaging a periphery of an opponent gaming device 20 from the opponent gaming device 20.

[0025]

The reception time calculating part 294, for example, calculates a reception time, which is a cumulative time when the opponent video receiving part 293 receives the second video from the opponent gaming device 20 during a calculation period. Herein, "calculation period" is a period serving as a unit for defining a reception time, and can be arbitrarily set based on a type of game. The calculation period may be, for example, an entire period or a partial period of a first half, a latter half, one round, one turn, one game, or the like, or a period where a plurality of these periods are connected. A method of calculating a reception time is not particularly limited, and a conventionally known method can be arbitrarily used. For example, times for periods where a video is not received may be recorded, the times may be added together after an end of a game to calculate a cumulative time where a video has not been received, and then the cumulative time may be subtracted from a time required for the calculation period to calculate the reception time. Note that a predetermined threshold may be provided for a duration of a condition where a video is not received, and a period where a condition in which a video is not received lasts less than the predetermined threshold value may be not be included in the period in which a video is not received. Two seconds, one second, or other arbitrary value may be used as the predetermined threshold, for example.

[0026]

The display processing part 295, for example, displays data related to darts game advancement received from the server 10 and opponent gaming device 20 or the second video received from the opponent gaming device 20. The automatic image transmitting part 296 is an example of the first video transmitting part, and for example, transmits a video generated by the imaging part 28 to the opponent gaming device 20.

[0027]

The received information transmitting part 297, for example, transmits received information transmitting part to the server 10. Herein, "received information" is information indicating a status of video reception from the opponent gaming device 20 of the gaming

device 20, and is information based on a time required for the calculation period, a reception time calculated by the reception time calculating part 294, identification information of the gaming device 20, and identification information of the opponent gaming device 20. The received information may include, for example, the time required for the calculation period, the reception time calculated by the reception time calculating part 294, the identification information of the gaming device 20, and the identification information of the opponent gaming device 20. Alternatively, the received information may include, for example, a ratio of the reception time calculated by the reception time calculating part 294 with regard to the time required for a calculation period.

[0028]

(2-1) Configuration of Server 10

FIG. 4 is a block diagram illustrating a functional configuration of the server 10. The server 10 is an example of an information processing device, and for example, executes a matching process, game advancing process, received information storing process, and faulty gaming device limiting process described later. The server 10 is provided with a server communicating part 11, a server storing part 12, and a server processing part 13.

[0029]

The server communicating part 11 is provided with a communication interface circuit for connecting the server 10 to the communication network 2, and communicates with the communication network 2. The server communicating part 11 supplies data received from the gaming device 20 or the like to the server processing part 13. Furthermore, the server communicating part 11 transmits the data supplied from the server processing part 13 to the gaming device 20 or the like.

[0030]

The server storing part 12 is provided with at least one of a magnetic tape device, magnetic disk device, or optical disk device. The server storing part 12 stores an operating system program, driver program, application program, data, and the like used for processing in the server processing part 13. For example, the server storing part 12 stores a program for

executing a matching process that matches a plurality of players as opponents, a program for advancing the darts game, or the like as an application program. A computer program may be installed in the server storing part 12 using a conventionally known setup program or the like from a portable computer-readable recording medium such as a CD-ROM, DVD-ROM, or the like for example. Alternatively, the computer program may be installed in the server storing part 12 by downloading from another information processing device via the communication network 2 or the like. Furthermore, for example, the server storing part 12 stores a video transmission success rate table or the like described later as data.

[0031]

The server processing part 13 is provided with one or a plurality of processors and peripheral circuitry thereof. The server processing part 13 is, for example, a CPU, and comprehensively controls an overall operation of the server 10. The server processing part 13 controls an operation of the server communicating part 11 or the like such that various processes of the server 10 are executed by an appropriate procedure based on a program or the like stored in the server storing part 12.

[0032]

The server processing part 13 is provided with a matching processing part 131, a game advancing part 132, a received information receiving part 133, a video transmission success rate acquiring part 134, a storage processing part 135, and a limiting part 136. The matching processing part 131 executes a matching process that matches a plurality of players as opponents for example. The game advancing part 132 executes a process related to advancing the darts game for example. The received information receiving part 133 receives the received information transmitted from the gaming device 20 for example. The video transmission success rate acquiring part 134, for example, acquires a ratio of the reception time with regard to the time required for the calculation period as a video transmission success rate indicating a video transmission status of the opponent gaming device 20, based on the received information. The storage processing part 135 stores the acquired video transmission success rate in the server storing part 12 for example. The limiting part 136, for example, determines a transmission failure condition, and then executes a limiting process that limits provision of an

online gaming service to the gaming device 20 by the server 10 based on the determination results. The transmission failure condition and limiting process will be described below.

[0033]

FIG. 5 is a diagram showing an example of the video transmission success rate table stored in the server storing part 12. The video transmission success rate table is a table where the video transmission success rate acquired by the video transmission success rate acquiring part 134 is recorded.

[0034]

As shown in FIG. 5, the video transmission success rate table contains a game ID, play time, transmitting side gaming device ID, receiving side gaming device ID, reception time, and video transmission success rate for example. The game ID is identification information for identifying a game. The play time is a time required for the game. The transmitting side gaming device ID is identification information for identifying a gaming device 20 on a video transmitting side. The receiving side gaming device ID is identification information for identifying a gaming device 20 on a video receiving side. The reception time is a cumulative time where the receiving side gaming device 20 received a video transmitted from the transmitting side gaming device 20. The video transmission success rate is a ratio of the reception time with regard to the play time, and indicates a video transmission status to the opponent gaming device 20, related to the transmitting side gaming device 20.

[0035]

In the present embodiment, two of the gaming devices mutually transmit and receive a video, and therefore, at least two video transmission success rates are defined for one game. For example, the video transmission success rate is expressed as “R (game ID / transmitting side gaming device ID / receiving side gaming device ID)” or the like. At this time, in a game where a game ID is "G1", a video transmission success rate "R(G1/C/D)" of a gaming device "C" for a video transmitted by the gaming device "C" to a gaming device "D", and video transmission success rate "R(G1/D/C)" of a gaming device "D" for a video transmitted by the gaming device "D" to a gaming device "C" are defined.

[0036]

Herein, a transmission failure condition determined by the limiting part 136 of the server 10 will be described using FIG. 6. In FIG. 6, a plurality of video transmission success rates for a gaming device "A" are arranged in chronological order. The transmission failure condition, for example, is that a video transmission success rate of a predetermined ratio (first ratio) of the video transmission success rates included within a predetermined period (first period) is less than a predetermined threshold (first threshold). For example, the predetermined period is set to the most recent 5 games, the predetermined ratio is set to 100%, and the predetermined threshold is set to 70%. In the example shown in FIG. 6, a video transmission success rates of 100% for the video transmission success rates included in the most recent 5 games is the video transmission success rate "R(G61/A/D)", "R(G57/A/E)", "R(G54/A/C)", "R(G53/A/B)", and "R(G47/A/D)". Furthermore, the video transmission success rates "R(G61/A/D)", "R(G57/A/E)", "R(G54/A/C)", "R(G53/A/B)", and "R(G47/A/D)" are all less than 70%. Therefore, in this case, the video transmission success rates of 100% of the video transmission success rates included in the most recent 5 games are less than 70%, and therefore, the transmission failure condition is satisfied. Note that the predetermined period is not limited to the most recent predetermined period, and may be a predetermined period in the past. Furthermore, the predetermined ratio is not limited to 100%, and may be an arbitrary ratio such as 95%, 90%, 85%, 80%, 70%, 60%, and the like. Furthermore, the predetermined threshold is not limited to 70%, and may be an arbitrary threshold such as 95%, 90%, 85%, 80%, 60%, 1%, and the like. Furthermore, a plurality of transmission failure conditions may be set, and when any one of the transmission failure conditions of the plurality of transmission failure conditions is satisfied, the limiting part 136 of the server 10 may execute a limiting process.

[0037]

The following is a description of the limiting process that limits provision of an online gaming service which is executed by the limiting part 136 of the server 10 when the transmission failure condition is determined to be satisfied. A gaming device 20 where the transmission failure condition is satisfied has a high probability that a video transmitting function has a failure, and therefore, the limiting part 136 of the server 10 limits provision of

an online gaming service to the gaming device in various forms. For example, the limiting part 136 may exclude the gaming device 20 where the transmission failure condition is satisfied from a target of matching performed by the matching processing part 131, for at least a predetermined type of game where there is a high request for prevent player fraud. Furthermore, the limiting part 136 may notify the gaming device 20 where the transmission failure condition is satisfied of predetermined limiting information, and when the predetermined limiting information is received, the gaming device 20 may limit a login operation of a player to the gaming device 20.

[0038]

(3) Operation of Gaming System 1

(3-1) Matching Process, Game Advancing Process, and Received Information Storing Process

FIG. 7 is a diagram showing an example of an operation sequence related to a matching process, a game advancing process, and a received information storing process based on the gaming system 1. Hereinafter, it is assumed that player A and player B are opponents based on matching. A gaming device operated by player A is referred to as a gaming device 20A, and a gaming device operated by player B is referred to as a gaming device 20B. Furthermore, as appropriate, symbol “A” is attached to the end of each configuration provided by the gaming device 20A, and symbol “B” is attached to the end of each configuration provided by the gaming device 20B. The operation sequence is executed in cooperation with the elements of the server 10, gaming device 20A, and gaming device 20B primarily by the server processing part 13, gaming device processing part 29A, and gaming device processing part 29B based on programs stored in advance in the server storing part 12, a gaming device storing part 22A, and a gaming device storing part 22B.

[0039]

Step S101

First, an operating part 23A of the gaming device 20A receives a matching request operation by the player A. For example, the player A inputs information such as an ID of the player A, a desired game type, or the like as information containing a matching request.

[0040]

Step S102

Next, a matching requesting part 291A of the gaming device 20A transmits the matching request received in step S101 to the server 10.

[0041]

Step S103

Furthermore, similar to step S101, an operating part 23B of the gaming device 20B receives a matching request operation by the player B.

[0042]

Step S104

Furthermore, similar to step S102, a matching requesting part 291B of the gaming device 20B transmits the matching request received in step S103 to the server 10.

[0043]

Step S105

Next, the matching processing part 131 of the server 10 performs a matching process. Herein, it is assumed that the player A and player B have been matched together as opponents by the matching process.

[0044]

Step S106

Next, the matching processing part 131 of the server 10 transmits a match determination notification, which is information indicating that the player A and player B are opponents of each other, to the gaming device 20A and gaming device 20B.

[0045]

Step S107

Next, the server 10, gaming device 20A, and gaming device 20B executes a darts game advancing process. At this time, a score, a number of rounds, and other data related to darts game advancement (game data) are transmitted and received between the server 10, gaming device 20A, and gaming device 20B. Furthermore, video data of the gaming device 20A and gaming device 20B are transmitted and received between the gaming device 20A and gaming device 20B.

[0046]

Specifically, a game advancing part 292A of the gaming device 20A transmits data indicating a score of the player A or the like to the server 10 and gaming device 20B, based on a detection signal generated by a detecting part 26A when the player A launches the dart. Furthermore, an imaging part 28A of the gaming device 20A images a periphery (player A, darts game field, gaming device 20A, and the like) of the gaming device 20A to generate a video and then outputs to the gaming device processing part 29A. Furthermore, an automatic image transmitting part 296A of the gaming device processing part 29A transmits the video where the periphery of the gaming device 20A is imaged to the gaming device 20B. Furthermore, an opponent video receiving part 293A of the gaming device 20A receives a video of a periphery of the gaming device 20B generated by an imaging part 28B from the gaming device 20B. Furthermore, a display processing part 295A of the gaming device 20A combines data related to darts game advancement received from the server 10 and gaming device 20B and a video where a periphery of the gaming device 20B is imaged received from the gaming device 20B and then displays a game screen described later on a displaying part 24A.

[0047]

Furthermore, in a similar manner, a game advancing part 292B of the gaming device 20B transmits data indicating a score of the player B or the like to the server 10 and gaming device 20A, based on a detection signal generated by a detecting part 26B when the player B launches the dart. Furthermore, an imaging part 28B of the gaming device 20B images a periphery (player B, darts game field, gaming device 20B, and the like) of the gaming device 20B to generate a video and then outputs to the gaming device processing part 29B. Furthermore, an automatic image transmitting part 296B of the gaming device processing part

29B transmits the video where the periphery of the gaming device 20B is imaged to the gaming device 20A. Furthermore, an opponent video receiving part 293B of the gaming device 20B receives a video of a periphery of the gaming device 20A generated by the imaging part 28A from the gaming device 20A. Furthermore, a display processing part 295B of the gaming device 20B combines data related to darts game advancement received from the server 10 and gaming device 20A and a video where a periphery of the gaming device 20A is imaged received from the gaming device 20A and then displays a game screen described later on a displaying part 24B.

[0048]

Herein, an example of a game screen 500 displayed in the displaying part 24A of the gaming device 20A and the displaying part 24B of the gaming device 20B will be described using FIG. 8. As illustrated in FIG. 8, the game screen 500 contains a game data region 501, a video region 502A, and a video region 502B. Scores of the player A and player B, number of rounds, and other data related to darts game advancement are displayed in the game data region 501. A video generated by the imaging part 28A imaging a periphery (player A, gaming device 20A, or the like) of the gaming device 20A is displayed in the video region 502A. A video generated by the imaging part 28B imaging a periphery (player B, gaming device 20B, or the like) of the gaming device 20B is displayed in the player B video region 502B.

[0049]

Step S108

When the advancing process (step S107) of the darts game ends, a reception time calculating part 294A of the gaming device 20A calculates a reception time, which is a cumulative time where a video is received from the gaming device 20B by the opponent video receiving part 293A, during advancement of the calculation period.

[0050]

Step S109

Next, a received information transmitting part 297A of the gaming device 20A transmits to the server 10 received information based on a time required for the calculation period, reception time calculated by the reception time calculating part 294A and identification information of the gaming device 20A, and identification information of the opponent gaming device 20B. At this time, the received information transmitting part 297A may include a time required of the calculation period and a reception time calculated by the reception time calculating part 294A in the received information. Alternatively, the received information transmitting part 297A may include, for example, a ratio of the reception time calculated by the reception time calculating part 294A with regard to the time required for a calculation period in the received information.

[0051]

Step S110

Furthermore, similar to step S108, when the advancing process (step S107) of the darts game ends, a reception time calculating part 294B of the gaming device 20B calculates a reception time, which is a cumulative time where a video is received from the gaming device 20A by the opponent video receiving part 293B, during advancement of the calculation period.

[0052]

Step S111

Furthermore, similar to step S019, a received information transmitting part 297B of the gaming device 20B transmits to the server 10 received information based on a time required for the calculation period, reception time calculated by the reception time calculating part 294B and identification information of the gaming device 20B, and identification information of the opponent gaming device 20A. At this time, the received information transmitting part 297B may include a time required of the calculation period and a reception time calculated by the reception time calculating part 294B in the received information. Alternatively, the received information transmitting part 297B may include, for example, a ratio of the reception time calculated by the reception time calculating part 294B with regard to the time required for a calculation period in the received information.

[0053]

Step S112

Next, the received information receiving part 133 of the server 10 receives the received information transmitted from the gaming device 20A and received information transmitted from the gaming device 20B.

[0054]

Step S113

Next, the video transmission success rate acquiring part 134 of the server 10 acquires a video transmission success rate " $R(*B/A)$ " indicating a video transmission status of the gaming device 20B based on the received information received from the gaming device 20A in step S112. Specifically, the video transmission success rate acquiring part 134 calculates a ratio of the reception times to the times required for the calculation period and sets the ratio as the video transmission success rate " $R(*B/A)$ " when the time required of the calculation period and the reception time calculated by the reception time calculating part 294A is included in the received information received from the gaming device 20A. Furthermore, when a ratio of the the reception time calculated by the reception time calculating part 294A to the time required of the calculation period is included in the received information received from the gaming device 20A, the video transmission success rate acquiring part 134 sets the ratio as the video transmission success rate " $R(*B/A)$ ". Furthermore, in a similar manner, the video transmission success rate acquiring part 134 of the server 10 acquires a video transmission success rate " $R(*A/B)$ " indicating a video transmission status of the gaming device 20A based on the received information received from the gaming device 20B in step S112. Specifically, the video transmission success rate acquiring part 134 calculates a ratio of the reception times to the times required for the calculation period and sets the ratio as the video transmission success rate " $R(*A/B)$ " when the time required of the calculation period and the reception time calculated by the reception time calculating part 294B is included in the received information received from the gaming device 20B. Furthermore, when a ratio of the the reception time calculated by the reception time calculating part 294B to the time required of the calculation period is included in the received information received from the

gaming device 20B, the video transmission success rate acquiring part 134 sets the ratio as the video transmission success rate " $R(*A/B)$ ".

[0055]

Step S114

Next, the storage processing part 135 of the server 10 registers the video transmission success rate " $R(*A/B)$ " acquired in step S113 as in the video transmission success rate table stored in the server storing part 12 with a transmitting side gaming device ID as "A" and a receiving side gaming device ID as "B". In a similar manner, the storage processing part 135 registers the video transmission success rate " $R(*B/A)$ " acquired in step S113 as in the video transmission success rate table stored in the server storing part 12 with a transmitting side gaming device ID as "B" and a receiving side gaming device ID as "A". Thus, the matching process, game advancing process, and received information storing process based on the gaming system 1 end.

[0056]

(3-2) Faulty Gaming Device Limiting Process

FIG. 9 is a diagram showing an example of an operation flow related to a faulty gaming device limiting process based on the server 10. The operation flow is executed in cooperation with elements of the server 10 primarily by the server processing part 13, based on a program stored in advance in the server storing part 12.

[0057]

Step S201

First, the limiting part 136 of the server 10 determines whether or not the transmission failure condition is satisfied as described using FIG. 6 while referring to the video transmission success rate table stored in the server storing part 12. When the transmission failure condition is determined to not be satisfied (step S201; No), the faulty gaming device limiting process ends.

[0058]

Step S202

When the transmission failure condition is determined to be satisfied for any of the gaming devices 20 (step S201; Yes), the limiting part 136 of the server 10 performs the aforementioned limiting process for the gaming device 20, and then the faulty gaming device limiting process ends.

[0059]

(4) Modified Example

When matching is frequently performed with the gaming device 20 with a failure in a video receiving function, the transmission failure condition may be satisfied for the gaming device 20, which may be a target for a limiting process of the limiting part 136 of the server 10, even though the gaming device 20 has no failures with the video transmitting function. In order to prevent this situation, the limiting part 136 of the server 10 may determine whether or not a reception failure condition is satisfied, and determine the transmission failure condition based on only the video transmission success rate excluding the video transmission success rate where a gaming device 20 in which the reception failure condition is satisfied is set as a receiving side. Herein, the reception failure condition is a condition based on the transmission failure condition, and may be a condition determined based on a plurality of video transmission success rates where one gaming device 20 is set as a receiving side (and not as transmitting side) gaming device. For example, a reception failure condition according to a gaming device “A” is determined based on a plurality of video transmission success rates “ $R(*/*/A)$ ” where the gaming device “A” is set as the receiving side gaming device. The reception failure condition, for example, is that a video transmission success rate of a predetermined ratio (second ratio) of the video transmission success rates included within a predetermined period (second period) is less than a predetermined threshold (second threshold).

[0060]

In the aforementioned embodiment, the limiting part 136 treats video transmission success rates of a plurality of calculation periods equally, and determines the transmission failure condition. However, the transmission failure condition may be determined by changing a

weight of the video transmission success rates in each calculation period, based on a rule of a game. For example, a magnitude of a threshold may be changed for each calculation period, such as increasing the magnitude of the threshold for comparing the video transmission success rate according to the calculation period or the like, as a calculation period approaches an end of a game.

[0061]

As described above, in the present embodiment, the server 10 acquires a ratio of the reception time to the time required for the calculation period as the video transmission success rate indicating the video transmission status by the opponent gaming device, based on the received information received from the plurality of gaming devices 20. Based on this configuration, a video transmission status over an entire calculation period in a gaming device can be evaluated using an indicator which is the video transmission success rate.

[0062]

Furthermore, the server 10 stores the acquired video transmission success rate in the server storing part 12 in association with the identification information of the gaming device 20 on the video transmitting side and the identification information of the gaming device 20 on the video receiving side. Furthermore, the server 10 determines whether or not the predetermined transmission failure condition is satisfied for the plurality of video transmission success rates stored in the server storing part 12 in association with one gaming device 20, where the one gaming device 20 is set as the video transmitting side. Furthermore, the server 10 limits provision of an online gaming service to the one gaming device 20 when the predetermined transmission failure condition is satisfied. Based on this configuration, a video transmission status in a plurality of games, and particularly in a plurality of most recent games can be evaluated to improve accuracy of detecting a failure in a video transmission function of the gaming device 20.

[0063]

Note that the present invention is not limited to the aforementioned embodiments, and can be implemented in various other forms within a scope that does not depart from a gist of the present invention. Therefore, the embodiments are merely examples of each point, and are not

to be interpreted as limiting. For example, the processing steps described above can be changed to any order or implemented in parallel within a scope that does not contradict the processing contents. Furthermore, another step may be added between the processing steps. Furthermore, a step described as one step may be divided into a plurality of steps and then implemented, and a step described as being divided into a plurality of steps can be grasped as one step.

Description of Codes

[0064]

1... Gaming system, 2... Communication network, 10... Server, 11... Server communicating part, 12... Server storing part, 13... Server processing part, 131... Matching processing part, 132... Game advancing part, 133... Received information receiving part, 134... Video transmission success rate acquiring part, 135... Storage processing part, 136... Limiting part, 20... Gaming device, 21... Gaming device communicating part, 22... Gaming device storing part, 23... Operating part, 24... Displaying part, 25... Card RW part, 26... Detecting part, 27... Coin insertion part, 28... Imaging part, 29... Gaming device processing part, 291... Matching requesting part, 293... Opponent video receiving part, 294... Reception time calculating part, 295... Display processing part, 296... Automatic image transmitting part, 297... Received information transmitting part, CS... Card slot, DB... Dartboard

Claims

[Claim 1]

An information processing device that provides an online gaming service via a communication network to a plurality of gaming devices,

wherein each of the plurality of gaming devices comprises:

an imaging part that images a periphery of the gaming device to generate a first video;

a first video transmitting part that transmits the first video to an opponent gaming device;

a second video receiving part that receives a second video generated by imaging a periphery of the opponent gaming device from the opponent gaming device;

a displaying part;

a second video display processing part that displays the second video on the displaying part;

a reception time calculating part that calculates a reception time, which is a cumulative time when the second video receiving part receives the second video from the opponent gaming device during a calculation period; and

a received information transmitting part that transmits received information based on the time required for the calculation period, the reception time, identification information of the gaming device, and identification information of the opponent gaming device to the information processing device;

the information processing device, comprising:

a storing part;

a video transmission success rate acquiring part that acquires a ratio of the reception time to the time required for the calculation period as a video transmission success rate indicating a video transmission status by the opponent gaming device, based on the received information received from the plurality of gaming devices;

a storage processing part that stores the acquired video transmission success rate in the storing part in association with the identification information of the gaming device on a video transmitting side and the identification information of the gaming device on the video receiving side; and

a limiting part that determines whether or not a predetermined transmission failure

condition is satisfied for a plurality of video transmission success rates stored in the storing part in association with one gaming device with the one gaming device set as the video transmitting side, and limits provision of the online gaming service to the gaming device when the predetermined transmission failure condition is satisfied.

[Claim 2]

The information processing device according to claim 1, wherein the predetermined transmission failure condition is that the video transmission success rate of a predetermined first ratio of the video transmission success rates included within a predetermined first period is less than a predetermined first threshold.

[Claim 3]

The information processing device according to claim 1 or 2, further comprising a matching processing part that executes a matching process between the plurality of gaming devices, wherein the limiting part excludes the one gaming device from a matching process target of matching processing part.

[Claim 4]

The information processing device according to any one of claims 1 to 3, wherein the limiting part notifies the one gaming device of limiting information, and the gaming device limits a player from logging in to the gaming device when the limiting information is received from the information processing device.

[Claim 5]

The information processing device according to any one of claims 1 to 4, wherein the limiting part further determines whether or not the predetermined transmission failure condition is satisfied, excluding the video transmission success rate stored in the storing part in association with another gaming device when a predetermined reception failure condition is satisfied for a plurality of video transmission success rates stored in the storing part in association with the another gaming device with the another gaming device set as the video receiving side.

[Claim 6]

The information processing device according to any one of claims 1 to 5, wherein the predetermined reception failure condition is that the video transmission success rate of a predetermined second ratio of the video transmission success rates included within a predetermined second period is less than a predetermined second threshold.

[Claim 7]

A gaming device connected to an information processing device providing an online gaming service and to an opponent gaming device via a communication network, comprising:
 an imaging part that images a periphery of the gaming device to generate a first video;
 a first video transmitting part that transmits the first video to the opponent gaming device;
 a second video receiving part that receives a second video generated by imaging a periphery of the opponent gaming device from the opponent gaming device;

a displaying part;

a second video display processing part that displays the second video on the displaying part;

a reception time calculating part that calculates a reception time, which is a cumulative time when the second video receiving part receives the second video from the opponent gaming device during a calculation period;

a received information transmitting part that transmits received information based on the time required for the calculation period, the reception time, identification information of the gaming device, and identification information of the opponent gaming device to the information processing device; wherein

the information processing device contains:

a storing part;

a video transmission success rate acquiring part that acquires a ratio of the reception time to the time required for the calculation period as a video transmission success rate indicating a video transmission status by the opponent gaming device, based on the received information received from a plurality of gaming devices;

a storage processing part that stores the acquired video transmission success rate in the storing part in association with the identification information of the gaming device on a video

transmitting side and of the gaming device on the video receiving side; and

a limiting part that limits provision of the online gaming service to the gaming device when the predetermined transmission failure condition is satisfied for a plurality of video transmission success rates stored in the storing part in association with one gaming device with the one gaming device set as the video transmitting side.

[Claim 8]

A gaming system comprising a plurality of gaming devices connected via a communication network, and an information processing device that provides an online gaming service to the plurality of gaming devices, wherein

the plurality of gaming devices each contain:

an imaging part that images a periphery of the gaming device to generate a first video;

a first video transmitting part that transmits the first video to an opponent gaming device;

a second video receiving part receives a second video generated by imaging a periphery of the opponent gaming device from the opponent gaming device;

a displaying part;

a second video display processing part that displays the second video on the displaying part;

a reception time calculating part that calculates a reception time, which is a cumulative time when the second video receiving part receives the second video from the opponent gaming device during a calculation period; and

a received information transmitting part that transmits received information based on the time required for the calculation period, the reception time, identification information of the gaming device, and identification information of the opponent gaming device to the information processing device, and

the information processing device contains:

a storing part;

a video transmission success rate acquiring part that acquires a ratio of the reception time to the time required for the calculation period as a video transmission success rate indicating a video transmission status by the opponent gaming device, based on the received information received from the plurality of gaming devices;

a storage processing part that stores the acquired video transmission success rate in the storing part in association with the identification information of the gaming device on a video transmitting side and the identification information of the gaming device on the video receiving side; and

a limiting part that determines whether or not a predetermined transmission failure condition is satisfied for a plurality of video transmission success rates stored in the storing part in association with one gaming device with the one gaming device set as the video transmitting side, and limits provision of the online gaming service to the gaming device when the predetermined transmission failure condition is satisfied.