

GAMING DEVICE

Technical Field

[0001] The present invention relates to a gaming device.

Background Technology

[0002] Conventionally, a so-called online game where a plurality of players play a game match by operating gaming devices is performed 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 opposing gaming device.

[0003] For example, Patent Document 1 describes a gaming device provided with an imaging part, transmitting and receiving part, and displaying part. The transmitting and receiving part transmits a video of a player imaged by the imaging part to an opposing gaming device, and receives a video of an opposing player from the opposing gaming device. The displaying part displays the video of the received opposing player.

Prior Technology Documents

Patent Documents

[0004] Patent Document 1: International Publication 2015/173962

Summary of the Invention

Problem to be Solved by the Invention

[0005] Incidentally, the amount of video data is generally large. Therefore, in a configuration where a video is transmitted from a gaming device serving as a client to an opposing gaming device serving as another client via a server, a delay occurs, and thus real-time performance of the game is impaired. Therefore, in the online game described above, a configuration is often used where gaming devices perform P2P (Peer to Peer) communication with each other, and video is transmitted and received between the gaming devices.

[0006] However, when a P2P communication configuration is used in this manner and a fraudulent act such as a player who fell to a disadvantage improperly cuts off communication to end the game or the like, data serving as evidence does not remain on a server side, and therefore, it is difficult to verify whether or not an act is fraudulent.

[0007] In view of the foregoing, an object of the present invention is to provide a gaming device that can reliably preserve evidence data for verifying a fraudulent act when there is a possibility that a player has committed a fraudulent act while avoiding video delay, based on P2P communication.

Means for Solving Problems

[0008] A gaming device according to the present invention is a gaming device connected to a server and another gaming device via a communication network, containing: a storing part; a displaying part; a receiving part that receives a video generated by imaging a periphery of the other gaming device; a storage processing part that stores the video received by the receiving part to the storing part; a display processing part that displays the video received by the receiving part on the displaying part; a determining part that determines whether or not a predetermined video transmitting condition is satisfied; and a first transmitting part that transmits at least a portion of the video stored in the storing part to the server when the determining part determines that the predetermined video transmitting condition is satisfied.

Effect of the Invention

[0009] The present invention can provide a gaming device that can reliably preserve evidence data for verifying a fraudulent act when there is a possibility that a player has committed a fraudulent act, while avoiding video delay based on P2P communication.

Brief Description of the Drawings

[0010]

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 block diagram illustrating a functional configuration of a server 10.

FIG. 3 is a schematic external view of a gaming device 20.

FIG. 4 is a block diagram illustrating a functional configuration of the gaming device 20.

FIG. 5 is a diagram showing an example of an operation sequence related to a matching process and game advancing process based on the gaming system 1.

FIG. 6 is a diagram illustrating an example of a gaming screen.

FIG. 7 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

[0011] Various embodiments of the present invention will be described below while referring to the drawings. However, technical scope of the present invention is not limited to the embodiments, but extends to inventions described in the claims and equivalents thereof.

[0012] (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 are installed in separate stores for example. Note that the plurality of gaming devices 20 may be installed in the same store.

[0013] (2) Configuration of Each Device

(2-1) Configuration of Server 10

FIG. 2 is a block diagram illustrating a functional configuration of the server 10. The server 10 is an information processing device for executing a process related to player matching and a process related to a darts game advancement. The server 10 is provided with a server communicating part 11, a server storing part 12, and a server processing part 13.

[0014] 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.

[0015] 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.

[0016] 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. The server processing part 13 is provided with a matching

processing part 131, a game advancing part 132, and a video receiving part 133. 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 video receiving part 133 receives a video transmitted by the gaming device 20 for example.

[0017] (2-2) Configuration of Gaming Device 20

FIG. 3 is a schematic external view of the gaming device 20. FIG. 4 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 throws a dart at the dartboard DB from a field appropriately set in front of the gaming device 20.

[0018] 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.

[0019] 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.

[0020] 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.

[0021] 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.

[0022] 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.

[0023] 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 to the game card.

[0024] 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 thrown by a player is received in one of the plurality of holes provided in the target area.

[0025] 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 thrown 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.

[0026] 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.

[0027] 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 includes 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.

[0028] 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.

[0029] The gaming device processing part 29 is provided with a matching requesting part 291, a game advancing part 292, a receiving part 293, a storage processing part 294, a display processing part 295, a determining part 296, a first transmitting part 297, a second transmitting part 298, and an instruction receiving part 299. These parts are functional modules implemented by a program executed by the processor provided by the gaming device processing part 29. Alternatively, these parts may be implemented in the gaming device 20 as firmware. 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 receiving part

293 receives a video received from the other gaming device for example. The storage processing part 294 stores the video received by the receiving part 293 to the gaming device storing part 22 for example. The display processing part 295, for example, combines data and/or another video related to darts game advancement received by the receiving part 293 and then displays on the displaying part 24. The determining part 296 determines whether or not a predetermined video transmitting condition is satisfied for example. The predetermined video transmitting condition, for example, is that reception of a video by the receiving part 293 is interrupted. The first transmitting part 297 transmits at least a portion of the video stored in the gaming device storing part 22 to the server 10 for example. The second transmitting part 298 transmits the video generated by the imaging part 28 to the other gaming device for example. The instruction receiving part 299 receives instruction by a user for example.

[0030] (3) Operation of Gaming System 1

Next, an operation of the gaming system 1 will be described. 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.

[0031] (3-1) Matching Process and Game Advancing Process

FIG. 5 is a diagram showing an example of an operation sequence related to a matching process and game advancing process based on the gaming system 1. 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.

[0032] 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.

[0033] 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.

[0034] Step S103

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

[0035] Step S104

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

[0036] 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.

[0037] 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.

[0038] 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.

[0039] 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 throws 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, a second transmitting part 298A 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, 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.

[0040] 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 throws 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, a second transmitting part 298B 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, 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.

[0041] 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. 6. As illustrated in FIG. 6, 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.

[0042] (3-2) Video Transmitting Process

FIG. 7 is a diagram showing an example of an operation flow related to a video transmitting process based on the gaming device 20. The operation flow is executed in cooperation with the element of the gaming device 20 primarily by the gaming device processing part 29, based on a program stored in advance in the gaming device storing part 22. In the operation flow, the determining part 296 of the gaming device 20 determines whether or not reception of a video transmitted from the other gaming device by the receiving part 293 is interrupted. Furthermore, if it is determined that an interruption has occurred, the first transmitting part 297 of the gaming device 20 transmits at least a portion of the video to the server 10.

[0043] Hereinafter, an example will be described of a case where a darts game is performed between gaming device 20A and gaming device 20B, and the gaming device 20A transmits to the server 10 a video where a periphery of the gaming device 20B is imaged or the like.

[0044] Step S201

First, when a darts game is started, a determining part 296A of the gaming device processing part 29A resets a count value N ($N \rightarrow 0$).

[0045] Step S202

Next, the determining part 296A determines whether or not a receiving part 293A has received a video from the gaming device 20B.

[0046] Step S203

If the receiving part 293A is determined to have received a video from the gaming device 20B in step S202 (step S202; Yes), the determining part 296A resets the count value N ($N \rightarrow 0$).

[0047] Step S204

Next, a storage processing part 294A stores the video received by the receiving part 293A from the gaming device 20B to the gaming device storing part 22A. Furthermore, the process returns to step S202.

[0048] Step S205

On the other hand, if the receiving part 293A is determined to not have received a video from the gaming device 20B in step S202 (step S202; No), the determining part 296A increases the count value N by only 1 ($N \rightarrow N + 1$).

[0049] Step S206

Next, the determining part 296A determines whether or not the count value N is above a predetermined threshold. If the count value N is determined to not be above the predetermined threshold in step S206 (step S206; No), the process returns to step S202. Herein, the predetermined threshold can be arbitrarily set. By setting the predetermined threshold, setting can be performed such that the gaming device 20A transmits the video to the server 10, when a condition where the receiving part 293A has not received a video for a predetermined period of time continues.

[0050] Step S207

When the count value N is determined to be higher than the predetermined threshold in step S206 (step S206; Yes), the first transmitting part 297A transmits at least a portion of the video of the periphery of the gaming device 20B stored in the gaming device storing part 22A to the server 10. At this time, the first transmitting part 297A may transmit all videos stored in the gaming device storing part 22 to the server 10. Alternatively, the first transmitting part 297A may transmit a portion of videos stored in the gaming device storing part 22 to the server 10. At this time, a portion of videos transmitted by the first transmitting part 297A may or may not be a latest portion in a time series of videos stored in the gaming device storing part 22. Note that when the instruction receiving part 299 receives instruction from a user, the first transmitting part 297A may transmit at least a portion of the videos of the periphery of the gaming device 20B stored in the gaming device storing part 22A to the server 10. Thus, the video transmitting process ends.

[0051] As described above, the determining part 296 of the gaming device 20 determines whether or not reception of a video transmitted from the other gaming device by the receiving part 293 is interrupted. Furthermore, if it is determined that an interruption has occurred, the first transmitting part 297 of the gaming device 20 transmits at least a portion of the video to the server 10. Furthermore, the server 10 receives the video transmitted by the gaming device 20 via the video receiving part 133 or the like. The server 10 can identify a cause of communication failure based on the video. Therefore, this configuration can reliably preserve evidence data for verifying a fraudulent act when there is a possibility that a player has committed a fraudulent act while avoiding video delay based on P2P communication.

[0052] Note that in the aforementioned embodiment, a predetermined video transmitting condition determined by the determining part 296 was reception of a video by the receiving part 293 was interrupted, but is not limited thereto. The predetermined video transmitting condition may, for example, include a predetermined fraudulent act by a player in a video received by the receiving part 293. Herein, the predetermined fraudulent act and a configuration where the determining part 296 is provided to determine the predetermined fraudulent act are not particularly limited. For example, the predetermined fraudulent act includes an act of obstructing imaging by a player covering the imaging part 28 with a hand or the like. In this case, the determining part 296 may be provided with an arbitrary configuration for determining that the fraudulent act is included in a video received by the receiving part 293. For example, the determining part 296 may be provided with means for confirming a predetermined object (player's hand, fingerprint, face, or other part of a player's body, a dedicated or general accessory worn by the player, or the like) registered in advance, and determining whether or not the recognized predetermined object has a size larger than a predetermined threshold in an image frame configuring a video, or whether or not the predetermined object cannot be recognized within the video. With this configuration, the gaming device can transmit a video to a server device when a player approaches the imaging part 28 to a distance not expected during normal play or when a player is not present at a location where the player should be present during normal play, in order to obstruct imaging of the video by the imaging part 28. Alternatively, the determining part 296 may be provided with means for calculating information indicating a brightness of an image frame configuring a video (may be information calculated

based on a information such as brightness or the like of pixels included in the image frame, and includes information calculated based on a plurality of image frames included in a predetermined period), and determining whether or not the information indicating the calculated brightness is less than a predetermined threshold. With this configuration, the gaming device can transmit a video to a server device when a video darkens to a certain level in a case where a player covers the imaging part 28 with a hand, or the like.

[0053] The predetermined video transmitting condition may, for example, not include a predetermined normal play action by a player in a video received by the receiving part 293. Herein, the predetermined normal play action can be arbitrarily set based on the type of game. For example, in the case of a darts game, a predetermined normal play action may be an act such as a player throwing a dart or the like. Furthermore, the determining part 296 may be provided with means for determining whether or not the predetermined normal play action is included in a video received by the receiving part 293 based on a form of the predetermined normal play action. For example, if the predetermined normal play action is throwing a dart, the determining part 296 may be provided with means for detecting a speed of a player's hand, a dart, or the like by analyzing a video, and then determining that a dart throw is a normal play action when the detected speed is higher than a predetermined threshold. Furthermore, the determining part 296 may be provided with means for calculating a period during which a predetermined normal play action is not recognized, and then determining whether or not the calculated period is greater than a predetermined threshold. With this configuration, the gaming device can transmit a video to a server device when an action of a player that is normally assumed in a game has not been performed for at least a predetermined fixed period of time.

[0054] 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

[0055] 1... Gaming system, 10... Server, 11... Server communicating part, 12... Server storing part, 13... Server processing part, 131... Matching processing part, 132... Game advancing part, 133... Video receiving part, 20, 20A, 20B... 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, 292... Game advancing part, 293... Receiving part, 294... Storage processing part, 295... Display processing part, 296... Determining part, 297... First transmitting part, 298... Second transmitting part, 299... Instruction receiving part, CS... Card slot, DB... Dartboard

CLAIMS

[Claim 1]

A gaming device connected to a server and another gaming device via a communication network, comprising:

a storing part;

a displaying part;

a receiving part that receives a video generated by imaging a periphery of the other gaming device;

a storage processing part that stores the video received by the receiving part to the storing part;

a display processing part that displays the video received by the receiving part on the displaying part;

a determining part that determines whether or not a predetermined video transmitting condition is satisfied; and

a first transmitting part that transmits at least a portion of the video stored in the storing part to the server when the determining part determines that the predetermined video transmitting condition is satisfied.

[Claim 2]

The gaming device according to claim 1, wherein the predetermined video transmitting condition is that reception of the video by the receiving unit is interrupted.

[Claim 3]

The gaming device according to claim 1 or 2, wherein the predetermined video transmitting condition is that a fraudulent act by a player is included in the video received by the receiving

part, or a predetermined normal play action by a player is not included in the video received by the receiving part.

[Claim 4]

The gaming device according to any one of claims 1 to 3, further comprising:
an imaging part that images a periphery of the gaming device; and

a second transmitting part that transmits a video generated by the imaging part imaging a periphery of the gaming device to the other gaming device.

[Claim 5]

The gaming device according to claim 4, wherein the display processing part displays a video generated by the imaging part imaging a periphery of the gaming device on the displaying part.

[Claim 6]

The gaming device according to any one of claims 1 to 5, further comprising: an instruction receiving part that receives a player instruction,

wherein the first transmitting part transmits at least a portion of the video stored in the storing part to the server when the instruction receiving part receives a player instruction.