

GAME VALIDATION USING GAME PLAY EVENTS AND VIDEO

BACKGROUND

[0001] Table-based games continue to be an immensely popular form of gaming. Such table games include, for example, Poker, Blackjack, Baccarat, Craps, Roulette and other traditional games, as well as other more recently introduced games such as Pai-Gow, Caribbean Stud, and Spanish Blackjack, among others. In a typical game, a player places a wager on a game, wherein a winning may be paid to the player depending on an outcome of the game. As is generally known, a wager may involve the use of cash, chips, markers, as well as various forms of claims. The game itself may involve the use of, for example, cards, dice, wheels, balls, or tokens, with the rules of the game and any payouts or pay tables being established prior to game play. Possible winnings may be paid in cash, credit, chips, markers, prizes, or other forms of payouts.

[0002] An operator may employ playing card dispensers, such as shoes, to facilitate dealing of the cards in one of the above mentioned playing card-based games. In a game of Blackjack, for example, a shoe is stocked with one or more decks of shuffled playing cards. Conventionally, a front panel of the shoe includes an opening extending upward from a bottom of the shoe through which the back of the next card to be dealt is exposed. To access the next card, one slides one's fingers along the opening with a result that the next card is moved downward and out through a slot in the bottom of the shoe.

[0003] Known shoes are designed to be used with cards that can be touched and felt by the dealer. Hence, the dealer may be able to manipulate the cards. For example, the dealer may be able to collude with a player to provide select cards to the player. Alternatively, when a number of players are playing a card game, the dealer's attention may be temporarily diverted to one end of a table, for example when dealing the playing cards, thereby providing an opportunity for two players at an opposite end of the table to swap playing cards.

[0004] Radio frequency identification (RFID), optical scanning, and other technologies have been employed in the gaming industry. With respect to playing cards and card dispensers, it is possible to provide data relating to individual cards that are distributed from the above mentioned card dispensers. Such dispensers may be referred to as intelligent card dispensers or intelligent shoes.

[0005] In addition, it is known to videotape and/or view these games through a camera mounted above the playing table. However, these monitoring methods generally do not provide enough clarity to detect cheating via the above described methods and others. Further, even if enough clarity is generated to view all aspects of individual gaming events, it still requires an inordinate amount of manual effort to review all of the gaming activity videos in an attempt to detect and evaluate "security events." The amount of time required increases both operating costs and the difficulty of detecting cheating in a timely manner. It further has been difficult to synchronize the video with data from a particular game or card from a game even when considering the availability of the RFID and other data provided directly by the gaming devices.

BRIEF DESCRIPTION

[0006] Embodiments of the invention enable a gaming operator to validate gaming operations. At least one game tracking device is configured to detect and communicate game play events in a game. At least one video device is configured to provide a video signal. The game play events are received from the game tracking device. The video signal is received from the video device. A graphical representation of each of the received game play events is combined with the received video signal to generate a combined video signal. Searching for game play events is enabled.

[0007] This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Figure 1 is a schematic diagram of an exemplary system in which game play events and video are combined and presented to a user.

[0009] Figure 2 is an example flowchart for validating gaming operations.

[0010] Figure 3 is an example frame from a video signal.

[0011] Figure 4 is an example frame from a combined video signal.

[0012] Figure 5 is an example frame from a combined video signal including a warning type game play event.

[0013] Figure 6 is an example screen shot of a user interface for searching for game play events.

[0014] Figure 7 is a block diagram of data processing in an exemplary system.

[0015] Figure 8 is an example frame from a second video signal.

[0016] Figure 9 is an example frame from a combination of two video signals.

[0017] Figure 10 is an example frame from a combination of two video signals combined with graphical representations of game play events.

DETAILED DESCRIPTION

[0018] Embodiments of the invention enable a gaming operator to validate gaming operations. Validation is performed using video of a game combined with graphical representations of game play events generated by gaming equipment. Game play events can be searched. Aspects of the invention may be implemented with a system such as that shown in Figure 1.

[0019] Combining a graphical representation of game play events with a video signal to create a searchable record of a game reduces the amount of time required to review the game for evidence of cheating. This reduction in time improves operating efficiencies and speed of security event detection. Furthermore, automated searching can be configured to detect suspicious conditions in a game and provide a notification to a user with a corresponding video clip. Such automated monitoring may detect security events that manual review would fail to recognize.

[0020] Referring to Figure 1, a schematic diagram illustrates an exemplary system 100 in which game play events and video are combined and presented to a user 105. User 105 accesses a user computing device 110 such as a browser client to view game information presented thereon. Game information is communicated to the user computing device 110 through a network 115. The network 115 is any type of network that communicatively couples computing devices. Examples of the network 115 include the Internet, a peer to peer (P2P) network, a local area network (LAN), or a wide area network (WAN).

[0021] The user computing device 110 is any device capable of accessing the network 115 and presenting game information to the user 105. By way of example only, and not limitation, these devices include a laptop, a desktop computer, or a cellular phone or smart phone. The user computing device 110 includes a form of computer-readable media that stores, among other things, applications or programs. The user computing device 110 includes a user input device that enables the user 105 to enter information into the user computing device 110. These include, for example, a keyboard, a pointing device, or an audio input device. The user computing device 110 also includes one or more output devices, such as a graphical display device or an audio output device.

[0022] Stored on the computer-readable media associated with the user computing device 110 is a user interface such as, among other possibilities, a web browser. Web browsers enable users, such as user 105, to display and interact with media (e.g., game play events and video) and other information typically embedded on a web page or a website on the server computing device 120.

[0023] Server computing device 120 is communicatively coupled through the network 115 to the user computing device 110. Server computing device 120 is any type of server that contains a processor operable to execute computer executable instructions and a memory to store and retrieve information. The server computing device 120 is communicatively coupled to at least one video device 125, such as, for example, a video camera. The video device 125 is configured to provide a video signal depicting a game. Multiple video devices 125 may be used to provide multiple perspectives of the game. The server computing device 120 is communicatively coupled to at least one game tracking device 130. The game tracking device 130 provides information regarding game play. For example, the game tracking device 130 may be an intelligent card shoe that communicates the identity and/or value of a playing card as it is dispensed. The game tracking device 130 may also be a card tracking device that detects card position on a table or any other device capable of providing information about a game or the people involved in the game.

[0024] The server computing device 120 is communicatively coupled to a game information storage device 135 which serves as a memory area. The game information storage device 135 can be used to store game play information such as game play events and game video. The game information storage device 135 can be a form of computer-readable media, such as a hard disk drive or optical disk drive. In some embodiments, the literary work storage device 135 is integrated with the server computing device 120. In some embodiments, the game information storage device 135 includes a database such as a relational, hierarchical, or object-oriented database. Game play events are stored in the database of game information storage device 135 and can later be searched for using a standard query language. Video signals may be stored as items in such a database, as files, or in any other appropriate form in the game information storage device 135.

[0025] In some embodiments, the invention is implemented as a system having a memory area, which may take the form of a game information storage device 135, for storing at least one video signal and multiple game play events. The system also includes a processor configured to receive at least one video

signal including video of a game. The processor stores the video signal in the memory area. The processor receives game play events from at least one game tracking device 130 and stores the game play events in the memory area. The processor is further configured to search for one or more of the stored game play events to generate search results. For each of the search results, the processor combines a graphical representation of the search result with a corresponding portion of the stored video signal to generate a combined video signal.

[0026] Multiple video signals may be received by the processor for a single game. In some embodiments, receiving at least one video signal comprises receiving multiple video signals and combining the video signals into a single video signal. In another embodiment, multiple video signals are received and stored separately. In this case, combining a graphical representation of the search result with a corresponding portion of the at least one stored video signal may include combining a graphical representation of the search result with a corresponding portion of at least one of the multiple stored video signals.

[0027] Searching for one or more of the stored game play events may include searching based on game piece value, game piece identification, player identification, operator identification, game outcome, payout, and/or time period. Other search criteria are also contemplated.

[0028] The game monitored by the system may be any type of game of chance played in a casino or other setting. Examples include a card game, a dice game, a table game, a reel game, and a wheel game, though other types of games are also contemplated. In some embodiments, the game tracking device 130 is a card dispenser which detects and communicates card identity and/or card value. Card identity and card value may be provided by an RFID chip embedded in a card or may be encoded in an optically scannable portion of a card, though other methods of card identification are also contemplated.

[0029] In another embodiment, the system includes at least one server in communication with at least one gaming apparatus. The system also includes at least one video device providing a video signal to the server. The system

includes a processor configured to receive a plurality of game play events from the gaming apparatus. The processor is further configured to receive the video signal from the video device and synchronize the received game play events with the received video signal. The processor is further configured to search for one or more of the received game play events to generate search results. For each of the search results, the processor is configured to combine a graphical representation of the search result with a corresponding portion of the received video signal to generate a combined video signal. The processor may be configured to provide the combined video signal to a user of a remote device.

[0030] The gaming apparatus may be a device that detects and communicates card identify and/or card value as described above.

[0031] Searching for one or more of the received game play events may include enabling a user of a remote device to provide search criteria and searching for one or more of the received game play events based on the provided search criteria. The search criteria may include game piece value, game piece identification, player identification, operator identification, game outcome, payout, and/or time period. Other search criteria are also contemplated.

[0032] Referring next to Figure 2, an example flowchart 200 illustrates a method for validating gaming operations. At least one game tracking device 130 is configured at 202 to detect and communicate game play events in a game. At least one video camera 125 is configured at 204 to have a view of the game and provide a video signal. At 206, game play events are received from the game tracking device 130 by the server computing device 120. At 208, a video signal is received from the video camera 125 by the server computing device 120. At 210, the server computing device 120 combines a graphical representation of each of the received game play events with the received video signal to generate a combined video signal. At 212, the server computing device 120 stores the combined video signal in the game information storage device 135. At 214, the server computing device 120 enables searching for one or more of the game play events in the stored video signal. Encryption may be applied to the video signal from the video camera, the combined video signal, and/or the stored video signal. Encrypting the data can

prevent tampering and establish the authenticity of the data if it is later used as evidence.

[0033] Audio may also be incorporated into the video signal. Where a video camera is connected to a microphone, for example, configuring a video camera at 204 to have a view of the game and provide a video signal may also include configuring the at least one video camera to provide a video signal combined with an audio signal from the microphone. Alternatively, at least one microphone near the game may be configured to provide an audio signal. The audio signal from the at least one microphone is received by the server computing device 120. The audio signal is added by the server computing device 120 to the video signal from the at least one video camera, the combined video signal, and/or the stored video signal.

[0034] Combining a graphical representation of each of the game play events with the received video signal at 210 may include associating each of the game play events with a position in the combined video signal. This association may be used later to identify a corresponding portion of the video signal for a given game play event. The game play events may also be stored in the game information storage device 135.

[0035] In some embodiments, a game play event is associated with a portion of a video signal by incorporating data about the game play event as a packetized elementary stream in a program stream or transport stream in which the video signal is also contained as a packetized elementary stream. In another embodiment, the game play event is associated with a portion of the video signal by defining a bookmark in the video signal. In another embodiment, the game play event is associated with a portion of the video signal by associating the game play event with a position in the video signal. The position may be expressed in absolute terms (e.g., a frame number or date and time) or relative terms, such as an offset in frames or time from a point in the video signal (e.g., the position of another event), or any other means of indicating a position that enables accurate seeking to the position.

[0036] Enabling searching for game play events at 214 may include receiving a request from a user for one or more game play events, searching the stored video signal for the requested game play events to generate search results, and providing to the user the portions of the stored video signal corresponding to the search results.

[0037] The game being validated may be any type of game of chance played in a casino or other setting. Examples include a card game, a dice game, a table game, a reel game, and a wheel game, though other types of games are also contemplated.

[0038] Referring next to Figure 3, an example frame 300 from a video signal is provided. In this example, the video signal is provided by a video camera 125 placed over a game table on which a card game is being played.

[0039] Referring next to Figure 4, an example frame 400 from a combined video signal is depicted. The original frame 300 is combined with graphical representations of game play events from two game tracking devices 130: a card tracking system and an intelligent shoe. In this example, the card tracking system indicates a card with a value of five of clubs ("C5") has been detected at a position on the table. A graphical representation of this event is superimposed on the original frame 300 to indicate the card position 420 and value 425. The intelligent card shoe indicates a card with an identification of "Pck1.231" and a value of "C5" has been dispensed from the shoe. A graphical representation 430 of this event is displayed above the original frame 300. Example frame 400 also includes a date 440 and time 450 at which the video signal and game play events were received.

[0040] In some embodiments, a graphical representation game play event information is superimposed or overlaid on the original video signal prior to storage of the video signal. The video signal is thus stored as a combined video signal. In some embodiments, the game play event information is superimposed or overlaid dynamically, at the time of review. The video signal is thus stored without any graphical representation of game play event information. In other embodiments, a graphical representation of game play event information is presented as a caption or

captions to the video signal such that nothing is superimposed or overlaid on the video signal. In embodiments where the event information is dynamically superimposed or presented as a caption, it is contemplated that multiple sources of event information may be available (e.g., from an intelligent card shoe and a card tracking system) and that a user may elect to view event information from only one or some of the available event sources. It is further contemplated that, when displaying a search result, graphical representations of several events may be displayed. Where event information is dynamically superimposed or presented as a caption, the system may emphasize the graphical representation of the game play event corresponding to a search result. Such emphasis may take the form of highlighting, coloring, flashing, emboldening, or any other method suitable to indicate the game play event corresponding to the search result.

[0041] In some embodiments, the system may display graphical representations of multiple events in the form of a “ticker,” similar to a stock ticker. The ticker may be displayed in a horizontal orientation at the top or bottom of a screen, or in a vertical orientation on the left or right side of the screen. Events presented in the ticker are automatically scrolled in a direction corresponding to the orientation of the ticker (i.e., events in a horizontal ticker scroll horizontally). In some embodiments, the ticker displays as many recent events as can be displayed in the ticker at once. When a new event is detected, the new event is added to the ticker, and the other events are scrolled, such that the oldest displayed event is no longer displayed. In some embodiments, a user can select an event from the ticker to view a portion of the video signal corresponding to the selected event.

[0042] In some embodiments, graphical representations of multiple events are displayed in a list. The list may include a particular number of recent events or all events which have occurred in a particular amount of time, such as the previous sixty seconds. The system may be aware of the beginning and end of a game, in which case the list may include all or a portion of the events from a single game. The list may be scrollable by the user to allow inclusion in the list of more events than can be displayed on a screen at once. In some embodiments, a user can

select an event from the list to view a portion of the video signal corresponding to the selected event.

[0043] Referring next to Figure 5, an example frame 500 from a combined video signal including a warning type game play event is provided. In this example, as in the example of Figure 4, a video signal is combined with graphical representations of events from two game tracking devices 130: a card tracking system and an intelligent card shoe. Four cards have been successfully detected by the card tracking system and intelligent card shoe. Graphical representations of the detection events are portrayed. A first player has been dealt a five of clubs, as indicated by position 510 and value 511. A second player has been dealt a six of hearts, as indicated by position 512 and value 513. A third player has been dealt an eight of spades, as indicated by position 514 and value 515. A fourth player has been dealt a nine of diamonds, as indicated by position 516 and value 517. In addition to the four cards described, a fifth card has been dealt to the first player. The card tracking system has identified a three of diamonds ("D3") on the table. The position 520 of the identified card is superimposed on the video signal. However, the intelligent card shoe has not communicated a dispensing event for a three of diamonds. The system detects a discrepancy between the event from the card tracking system and the lack of an event from the intelligent card shoe. A warning message 530 indicates the discrepancy. Further, the position 520 of the card for which no dispensing event was received is visually emphasized.

[0044] Referring next to Figure 6, an example screen shot depicts a user interface 600 for searching for game play events. User interface 600 is an example user interface that provides various video search capabilities. User interface 600 provides a basic card track search capability. Specifically, security personnel can select one or more of: find all events, print event record, enable tracking object, and mark events using check boxes 602. The particular selections determine the presentation of search results returned by selecting search button 604. In the illustrated example, "C5" is entered into the search for field, indicating that the search is limited to events associated with the five of clubs. Time fields 606 and 608 have a "from time" and a "to time" entered therein, for further narrowing of the search events

associated with the five of clubs. In the illustrated example, the search time is from 12:00:00 to 12:15:00, which is a fifteen minute window. A search result has been returned, and a corresponding frame 400 of combined video signal is included in the user interface 600. User interface 600 may further include controls for playing a portion of the combined video signal corresponding to the displayed frame 400.

[0045] In one application, user interface 600 is related to security staff entry of specific card information to be searched for a particular table at an approximate event time. Based on an entry into the “search for” field 604 and selection of the search button 610, a search is performed in the system which will return a portion of combined video signal associated with the specific event that occurred within the search time range. Real-time security video is generally a gaming venue’s first level of legal event evidence collection. From the most basic video record, to the addition of the tracking methods described herein, an ability to rapidly locate specific events in literally thousands of hours’ worth of surveillance video is provided as illustrated by the described embodiments.

[0046] In response to a user selecting the search button 610, the system may identify multiple game play events matching the specified criteria. In some embodiments, user interface 600 may include a list of search results from which a user may select a search result and view a portion of the combined video signal corresponding to the selected search result. In another embodiment, a search results user interface may be displayed. The search results user interface may include a list of search results from which a user can select a search result. When the user selects a search result, the user may be returned to user interface 600 and may view a portion of the combined video signal corresponding to the selected search result. Other methods for displaying and selecting among multiple search results are also contemplated.

[0047] Referring next to Figure 7, a block diagram illustrates data processing in an exemplary system. Packetized data is utilized, allowing for ease of conversion between disparate input sources, enabling IP data transport, and assisting in encoding the mixed signal inputs (video/audio/data).

[0048] Video information 702 such as a video signal is input to a video encoder 704. The video encoder 704 outputs encoded video 706 to a packetizer 708, which outputs a video packetized elementary stream (“PES”) 710. The video PES 710 is fed to both a program stream (“PS”) multiplexer 712 and a transport stream (“TS”) multiplexer 760. Audio information 732, either from a video device 125 or a discrete microphone, is input to an audio encoder 734. The audio encoder 734 outputs encoded audio 736 to a packetizer 738, which outputs an audio PES 740 to both the PS multiplexer 712 and TS multiplexer 760. Event information 750 is input to a packetizer 752, which outputs a data PES 754 to the TS multiplexer 760.

[0049] The PS multiplexer 712 combines the video PES 710 and the audio PES 740 into a program stream 720 suitable for purposes such as storage on a recordable medium, for example. The TS multiplexer 760 combines the video PES 710, audio PES 740, and data PES 754 into a transport stream 770 suitable for purposes such as transmission to a computing device, for example. Event information 750 may also be fed to the PS multiplexer 712 for inclusion in the program stream 720. Event information 750 may also be fed to video encoder 704 for inclusion, in graphical form, in encoded video 706. Furthermore, encryption may be applied to prevent tampering with the information and later establish the authenticity of the output. Potential encryption points include the encoders (i.e., video encoder 704 and audio encoder 734). Encryption may also be applied to a PES (i.e., between a packetizer such as packetizer 708 and a multiplexer such as PS multiplexer 712), the program stream 720, and/or the transport stream 770.

[0050] Referring next to Figure 8, an example frame 800 from a second video signal is provided. In this example, the video signal is provided by a video camera 125 placed behind a dealer at a game table to provide an additional perspective. Specifically, a video signal from this perspective may provide a better view of players at the table when compared with a video signal from a perspective above the table as depicted in Figure 3.

[0051] Referring next to Figure 9, an example frame 900 from a combination of two video signals is provided. Specifically, example frame 800 and example frame 300 are combined into the single example frame 900.

[0052] Referring next to Figure 10, an example frame 1000 from a combination of two video signals combined with graphical representations of game play events is provided. In this example, example frame 900 is combined with graphical representations of game play events from two game tracking devices 130: a card tracking system and an intelligent shoe. In this example, the card tracking system indicates a card with a value of five of clubs ("C5") has been detected at a position on the table. A graphical representation of the detection event is superimposed on the original frame 900 to indicate the card position 1005 and value 1010. The intelligent card shoe indicates a card with an identification of "Pck1.231" and a value of "C5" has been dispensed from the shoe. A graphical representation 1015 of the dispensing event is displayed above the original frame 900.

[0053] In some embodiments, video signals from multiple video devices (e.g., cameras) are stored separately. It is contemplated that in such an embodiment, a user may elect to view the video signal from only one or some of the available video devices.

[0054] Embodiments of the invention are extensible to combine information from many sources including multiple cameras, game piece (e.g., dice, cards, chips, etc.) tracking devices, table surface tracking technologies, imaging systems, staff-recorded information, player tracking information and any other relevant sources of information. Game play event information, for example, may be provided through a pluggable component model, in which events from a device are converted by an adapter into a standard form for use within the system. Support for new devices may thus be easily added by providing an appropriate adapter. Such an adapter may take the form of a network device that resides between a game tracking device and a processor or server computing device. An adapter may also be implemented as software on a computing device connected to the game tracking device. Other forms of adapters are also contemplated.

[0055] All of the recorded event information may be searched and used to rapidly find corresponding video sequences for review or even in situ wherein the video information/security data may be relayed to gaming staff via wireless devices. In the latter case, the system may be configured to automatically search for

events or conditions meeting predefined criteria. In addition, the system may include a notification mechanism. When a condition meeting the predefined criteria is detected, the system may automatically dispatch a notification to interested parties. The notification may take the form of an audible alarm, visible alarm, radio transmission, network transmission, SMS message, email message, or internal software message, though other forms of notification are also contemplated. The notification may include a link to the portion or portions of video corresponding to the detected condition, or may itself include the corresponding portion or portions of video.

[0056] In some embodiments, searching supports complex conditions. In some embodiments, at a black jack table, event information is received from an intelligent shoe, a card tracking system, and an intelligent chip dispenser. The system is configured to identify the cards dispensed to a player and the dealer and to calculate a payout amount for the player. The system receives a payout event including an actual payout amount from the intelligent chip dispenser and compares the actual payout amount with the calculated payout amount. If the actual payout amount and calculated payout amount do not match, the system may notify an interested party as described above.

[0057] In some embodiments, a video camera is directly connected to a computing device having a memory area and a processor configured to perform the methods described herein. In other embodiments, a video camera is connected to an intermediate video device such as a video recorder or video encoder. An intermediate video device may also be connected to game tracking devices or gaming apparatus such that the intermediate video device can combine a graphical representation of game play events with the video signal from the video camera.

[0058] In some embodiments, the graphic representation of a game play event is not added to the actual video, but overlaid based on a time stamp at the time of review. Such an implementation does not require encoding, but rather uses simple time-based synchronization. Such a configuration is contemplated to be compatible with legacy systems using tape format or other older forms of video storage, though this configuration is also compatible with modern video recording

systems. In this implementation, a start time stamp may be used on the video to synchronize it with the overlay or caption system. The overlay or caption system simply provides an approximate “time location” within the video and then any overlay or caption can be combined with the video if required.

[0059] In some embodiments, the event information may be recorded digitally on DVD, for example, with the associated video and inputs using encoding similar, but not limited to that shown in the figures. Such an embodiment is but one example configuration that provides precise video information position searching in relation to the game play event that the user wishes to review.

[0060] Using the information provided by current and contemplated gaming systems, the game tracking method described herein allows for precise location and review of game play events on the associated media. Thus, the system is operable to overlay all card position information on the security video, for example, allowing for a real-time examination of security events, disputes and the like. By combining information from multiple game tracking systems, all game pieces within a gaming venue can be tracked, and any event associated with the gaming venue can be quickly replayed for analysis.

[0061] Unlike some very costly spatial card tracking systems, which are often plagued with anomalies, the cost effective game tracking method described herein allows the combination of various new or existing technologies with basic high powered image analysis abilities provided by security video and human examination of said information. As the game tracking system can rapidly find and display security events, the invention is extremely valuable even in real-time table monitoring situations wherein security staff may request an immediate video review in response to a visual anomaly or suspicious play event. The embodiments are seen as an excellent adjunct to many of the current commercial spatial card tracking solutions in resolving difficult tracking issues, which currently requires expensive manual searching of video footage.

[0062] The embodiments also assist in cases where current commercial offerings lose track of gaming cards due to various limitations. As shown in the figures described above, a card is known to be on the table, but in these other commercial offerings, an identifier associated with the card is not available from the input device tracking the card. For instance, in particular environmental situations, for example, system anomalies and limitations of current spatial card tracking systems occur. In these cases it is very difficult to maintain an approximate location of the various cards. In particular, if the gaming cards are overlapped, the currently described systems and methods are operable to resolve such anomalies.

[0063] Security event review using the methods and systems described herein is quick and inexpensive. The described embodiments provide a cost effective solution compatible with legacy systems that is independent of the game tracking technology employed.

[0064] The described embodiments provide for either a retro-fit or newly designed system in which all of the current game play event information being processed can be collected and in a useful manner related to the basic security video information. Such information generally forms the foundation of any security issue check. The core system that is described can remain intact despite changes in the details of the event information and video received brought about by advancing technology.

Exemplary Operating Environment

[0065] By way of example and not limitation, computer readable media comprise computer storage media and communication media. Computer storage media store information such as computer readable instructions, data structures, program modules or other data. Communication media typically embody computer readable instructions, data structures, program modules, or other data in a modulated data signal such as a carrier wave or other transport mechanism and

include any information delivery media. Combinations of any of the above are also included within the scope of computer readable media.

[0066] Although described in connection with an exemplary computing system environment, embodiments of the invention are operational with numerous other general purpose or special purpose computing system environments or configurations. Examples of well known computing systems, environments, and/or configurations that may be suitable for use with aspects of the invention include, but are not limited to, mobile computing devices, personal computers, server computers, hand-held or laptop devices, multiprocessor systems, gaming consoles, microprocessor-based systems, set top boxes, programmable consumer electronics, mobile telephones, network PCs, minicomputers, mainframe computers, distributed computing environments that include any of the above systems or devices, and the like.

[0067] Embodiments of the invention may be described in the general context of computer-executable instructions, such as program modules, executed by one or more computers or other devices. The computer-executable instructions may be organized into one or more computer-executable components or modules. Generally, program modules include, but are not limited to, routines, programs, objects, components, and data structures that perform particular tasks or implement particular abstract data types. Aspects of the invention may be implemented with any number and organization of such components or modules. For example, aspects of the invention are not limited to the specific computer-executable instructions or the specific components or modules illustrated in the figures and described herein. Other embodiments of the invention may include different computer-executable instructions or components having more or less functionality than illustrated and described herein.

[0068] The order of execution or performance of the operations in embodiments of the invention illustrated and described herein is not essential, unless otherwise specified. That is, the operations may be performed in any order, unless otherwise specified, and embodiments of the invention may include additional or fewer operations than those disclosed herein. For example, it is contemplated that

executing or performing a particular operation before, contemporaneously with, or after another operation is within the scope of aspects of the invention.

[0069] When introducing elements of aspects of the invention or the embodiments thereof, the articles "a," "an," "the," and "said" are intended to mean that there are one or more of the elements. The terms "comprising," "including," and "having" are intended to be inclusive and mean that there may be additional elements other than the listed elements.

[0070] This written description uses examples to disclose the invention, including the best mode, and also to enable any person skilled in the art to practice the invention, including making and using any devices or systems and performing any incorporated methods. The patentable scope of the invention is defined by the claims, and may include other examples that occur to those skilled in the art. Such other examples are intended to be within the scope of the claims if they have structural elements that do not differ from the literal language of the claims, or if they include equivalent structural elements with insubstantial differences from the literal language of the claims.

CLAIMS:

1. A method for validating gaming operations, said method comprising:
 - configuring at least one game tracking device to detect and communicate game play events in a game;
 - configuring at least one video camera to have a view of the game and provide a video signal;
 - receiving the game play events from the at least one game tracking device;
 - receiving the video signal from the at least one video camera;
 - combining a graphical representation of each of the received game play events with the received video signal to generate a combined video signal that enables the graphical representation of each of the received game play events to be superimposed on an applicable frame of the video signal when the combined video signal is presented to a user;
 - storing the combined video signal; and
 - enabling searching for one or more of the game play events in the stored video signal.
2. The method of claim 1, wherein combining the graphical representation of each of the game play events with the video signal to generate the combined video signal comprises associating each of the game play events with a position in the combined video signal.
3. The method of claim 1, further comprising storing the game play events in a memory area.

4. The method of claim 1, wherein the game comprises one or more of the following: a card game, a dice game, a table game, a reel game, and a wheel game.
5. The method of claim 1, wherein the at least one game tracking device comprises a card dispenser which detects and communicates card identity.
6. The method of claim 1, wherein enabling searching comprises:
 - receiving a request from a user for one or more game play events;
 - searching the stored video signal for the requested game play events to generate search results; and
 - providing to the user the portions of the stored video signal corresponding to the search results.
7. The method of claim 1, wherein receiving the video signal from the at least one video camera comprises receiving the video signal from each of a plurality of video cameras and combining the video signals into a single video signal.
8. The method of claim 1, further comprising configuring the at least one video camera to provide a video signal combined with an audio signal.
9. The method of claim 1, further comprising:
 - configuring at least one microphone near the game to provide an audio signal;
 - receiving the audio signal from the at least one microphone; and
 - adding the audio signal to one or more of the following: the video signal from the at least one video camera, the combined video signal, and the stored video signal.
10. The method of claim 1, further comprising encrypting one or more of the following: the video signal from the video camera, the combined video signal, and the stored video signal.
11. A system for validating gaming operations, said system comprising:

a memory area for storing at least one video signal and a plurality of game play events; and

a processor programmed to:

receive at least one video signal, said at least one video signal comprising video of a game;

store the at least one video signal in the memory area;

receive a plurality of game play events from at least one game tracking device;

store the plurality of game play events in the memory area;

receive a search request to search for one or more of the stored plurality of game play events;

search for the one or more of the stored plurality of game play events to generate search results in response to the search request; and

for each of the search results, combine a graphical representation of the search result with a corresponding portion of the at least one stored video signal to generate a combined video signal that enables the graphical representation of the search result to be superimposed on an applicable frame of the video signal when the combined video signal is presented to a user.

12. The system of claim 11, wherein the game comprises one or more of the following: a card game, a dice game, a table game, a reel game, and a wheel game.

13. The system of claim 11, wherein the at least one game tracking device comprises a card dispenser which detects and communicates at least one of the following: card identity and card value.

14. The system of claim 11, wherein the processor is programmed to combine the graphical representation of the search result with the corresponding portion of the at least one stored video signal by combining a graphical representation of the search result with a corresponding portion of at least one of a plurality of stored video signals.
15. The system of claim 11, wherein the processor is programmed to receive a plurality of video signals and combine the video signals into a single video signal.
16. The system of claim 11, wherein the processor is programmed to search for one or more of the stored game play events by searching based on at least one of the following criteria: game piece value, game piece identification, player identification, operator identification, game outcome, payout, and time period.
17. A system for server-based gaming, said system comprising:
 - at least one server in communication with at least one gaming apparatus;
 - at least one video device providing a video signal to the server; and
 - a processor configured to:
 - receive a plurality of game play events from the gaming apparatus;
 - receive the video signal from the video device;
 - synchronize the received plurality of game play events with the received video signal;
 - receive a search request to search for one or more of the plurality of game play events;
 - search for the one or more of the received plurality of game play events to generate search results in response to the search request; and
 - for each of the search results, combine a graphical representation of the search result with a corresponding portion of the received video signal to

generate a combined video signal that enables the graphical representation of the search result to be superimposed on an applicable frame of the video signal when the combined video signal is presented to a user.

18. The system of claim 17, wherein the processor is further configured to provide the combined video signal to a user of a remote device.

19. The system of claim 17, wherein the at least one gaming apparatus comprises a device which detects and communicates at least one of the following: card identity and card value.

20. The system of claim 17, wherein the processor is configured to search for one or more of the received game play events by:

enabling a user of a remote device to provide search criteria; and

searching for one or more of the received game play events based on the provided search criteria.