GAMING MACHINE WITH BONUS LINES

TECHNICAL FIELD

The present invention relates to gaming machines. The present invention has particular, although not exclusive application to video and online gaming and gambling machines.

BACKGROUND

Gaming machines such as slot machines, fruit machines or poker machines are common in gambling establishments. The technology of gaming machines has changed over the years with traditional mechanical machines being replaced by video gaming machines. Online gaming sites have also been established on the Internet that enable players to turn their personal computers (PCs) into video gaming machines so that they can gamble from the comfort of their own homes.

Video gaming machines enable the playing of a game by a player. During the game, the player simulates pulling a handle to rotate a series of simulated reels (typically three) that have icons printed on them. Winning or losing is determined by which icons line up with a pay line that is located in the middle of a viewing window on a display of the machine. The player wins if each reel shows the same icon along the pay line, although certain combinations of different icons grouped along the pay line are sometimes winners as well. The winnings amount or payout depends upon the identity of the icons aligned with the pay line.

The Applicant has identified that players often tire of playing games of the foregoing type. Accordingly, it is an object of the present invention to provide an alternative gaming technique.

SUMMARY OF THE INVENTION

According to one aspect of the present invention, there is provided a method for determining a win on a gaming machine, the method involving the steps of:

forming, using at least one computational device, a two dimensional (2D) array of icons arranged in rows and ranks whereby some of the icons are active icons able to have been irregularly located within the 2D array and the other icons are inactive icons; and

determining the win using a group of active icons which are located in consecutive ranks.

Preferably, the step of determining involves identifying the group which includes active icons located in consecutive ranks that form a line. The line may be linear (i.e. straight) or nonlinear (e.g. zig-zag, curvilinear, crooked, etc.). The line may span the entire 2D array.

The step of forming may involve forming the 2D array in a memory device. The step of forming may involve forming the 2D array on a display. The method may further include the step of displaying, on the display, a map indicating the location of the active and inactive icons on the display. The map may not be superposed with the 2D array.

In one embodiment, the method further includes the step of concurrently displaying the entire 2D array. Alternatively, the 2D array may be displayed in a piece-meal fashion. In one embodiment, the group must include an active icon from every rank in the array to determine the win.

The active (and therefore inactive) icons may be randomly or pseudo-randomly located within the 2D array. Furthermore, the active icons may be able to have been regularly located within the 2D array, whether by choice or by chance.

The group may include identical active icons located in the consecutive ranks. Alternatively, step of determining may involve grouping active icons located in

the consecutive ranks to form the group, whereby one or more of the grouped icons have a first identity and the other grouped icons have a second identity. The icons may each be members of a respective one of a plurality of icon categories, and the group may include identical active icons which are members of one category and one or more active icons which are members of another category.

In one embodiment, the step of determining involves grouping icons in at least three consecutive ranks to form the group. Preferably, the rows are horizontally arranged and the ranks are columns which are vertically arranged. The 2D array may consist of three rows and five ranks whereby no more than two icons located in each rank may be active icons.

The method may further include the step of calculating winnings based upon the win. The step of calculating may involve increasing the winnings if one or more of the active icons in the group are members of a bonus set of icons. The step of calculating may involve increasing the winnings if one or more of the icons in the 2D array match a selected bonus icon. The step of calculating may involve increasing the winnings if a random bonus flag is displayed.

Between the steps of forming the 2D array and determining the win, the method may further include the step of substituting one or more icons in the formed 2D array with another icon. The step of substituting may involve substituting each instance of a randomly selected icon in the 2D array with the other icon. The step of substituting may involve substituting one or more array icons at respective randomly determined locations in the 2D array with the other icon. The other icon may be a wildcard icon.

According to another aspect of the present invention, there is provided a method for determining a win on a gaming machine, the method involving the steps of:

forming, using at least one computational device, a two dimensional (2D) array of icons arranged in rows and ranks whereby some of the icons are active icons and the other icons are inactive icons; and

determining the win using a group of active icons which are located in consecutive ranks whereby the group is able to not form a one dimensional array in the 2D array.

According to a further aspect of the present invention, there is provided a gaming machine or at least one computational device loaded with computer readable instructions for execution by one or more processors to thereby perform any one or more of the preceding methods. The gaming machine may be a video gaming machine or an online gaming machine. The computational device may include a remote server and/or a personal computer.

According to a further aspect of the present invention, there is provided a media, such as a magnetic or optical disk or solid state memory, containing computer readable instructions for execution by one or more processors to thereby perform any one or more of the preceding methods.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred features, embodiments and variations of the invention may be discerned from the following Detailed Description which provides sufficient information for those skilled in the art to perform the invention. The Detailed Description is not to be regarded as limiting the scope of the preceding Summary of the Invention in any way. The Detailed Description will make reference to a number of drawings as follows:

Figure 1 is a functional block diagram of a video gaming machine;

Figure 2 is a flowchart showing a wager method for a gaming software product using the video gaming machine of Figure 1 and in accordance with a first embodiment of the present invention;

Figure 3 shows an example of a display screen which is displayed on a display of the video gaming machine of Figure 1, whilst performing the method of Figure 2, during a "Bonus Lines" line game;

Figure 4 shows winning groups of the example of Figure 3;

Figure 5 shows an example of a display screen which is displayed on a display of the video gaming machine of Figure 1, whilst performing the method of Figure 2, during a "Booster Pack" bonus game;

Figure 6 shows an example of a display screen which is displayed on a display of the video gaming machine of Figure 1, whilst performing the method of Figure 2, during a "Premium Scatter" bonus game;

Figure 7 shows an example of a display screen which is displayed on a display of the video gaming machine of Figure 1, whilst performing the method of Figure 2, during a "Mystery Multiplier" bonus game;

Figure 8 shows an example of a display screen which is displayed on a display of the video gaming machine of Figure 1, whilst performing the method of Figure 2, during a "Symbol Evolution" bonus game;

Figure 9 shows an example of a display screen which is displayed on a display of the video gaming machine of Figure 1, whilst performing the method of Figure 2, during a "Substitute Plus" bonus game;

Figure 10 is a schematic diagram of an online gaming machine; and

Figure 11 is a flowchart showing a wager method for a gaming software product using the video gaming machine of Figure 1 and in accordance with a second embodiment of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

A video gaming machine 2 is shown in Figure 1. The video gaming machine 2 can be loaded with a software product which incorporates a number of gambling games which each give the player a chance to win.

According to a first embodiment of the present invention, there is provided a wager method 20 shown in Figure 2 and which can be performed by the software product loaded on the gaming machine 2. The wager method 20 enables a player to place a wager (or bet), and then play a line game 26 and a bonus game 30 with a view of winning winnings based upon the wager placed. A detailed description of the video gaming machine 2 and the wager method 20 is provided below.

Turning initially to Figure 1, the video gaming machine 2 includes a controller 4 which, in turn, includes a microprocessor, an electronic storage memory storing the software product and other electronic circuitry. The software product includes instructions for the processor to perform the wager method 20 and, by doing so, the controller 4 serves to control the operation of the video gaming machine 2. A game control console 6 is interfaced with the controller 4 and enables a player to make game selections and operate the video gaming machine 2.

The video gaming machine 2 further includes an electronic display 8 which is interfaced with the controller 4. The display 8 displays game information to the player during execution of the software product by the controller 4. Additionally, the video gaming machine 2 includes a wager receiver 10 which enables the player to make a payment and then be awarded a corresponding number of credits to wager when playing the games 26, 30. A payout dispenser 12 is also provided which may dispense the sum of the player's winnings in the form of cash or coinage.

The software product can be provided on a storage media, such as a magnetic or optical disk or solid state memory, which contains computer readable instructions for execution by the processor. In this manner, the software product can be downloaded from the storage media to the gaming machine 2 for execution.

Turing to Figure 2, the wager method 20 enables the player to play a line game 26, and an additional bonus game 30 which gives the player another chance to win. The wager method 20 can be continually repeated by the player who each time stakes a wager. The wager method 20 is described in detail below.

Initially at step 22, the player enters gaming input into the gaming machine 2 using the game control console 6. The input may include a payment received from the wager receiver 10, a selection as to whether to play either a "normal lines" or a "bonus lines" line game 26, and a wager credit amount to bet on the selected line game 26. Furthermore, the player may enter the number of lines to play in the line game whereby increasing number of lines yield a greater probability of obtaining a win as described further below.

At step 24, the controller 4 determines whether the "bonus lines" line game was selected by the player at step 22. If the "bonus lines" line game was selected, then the player plays the "bonus lines" line game at step 26b. Alternatively, if the "bonus lines" line game was not selected, then the player plays the "normal lines" line game at step 26a. A detailed description of both lines games 26a, 26b is provided below.

At step 28, the controller 4 determines whether the bonus game 30 is enabled which will give the player an additional chance to win. In the present embodiment, the bonus game 30 is enabled by default. Accordingly, at step 30, the controller 4 executes a random one of a plurality of possible bonus games 30. Each of the possible bonus games 30 to play is described in detail below.

At step 28, if the bonus game 30 was not enabled, the method 20 would pass directly to step 32.

At step 32, the controller 4 calculates and tallies any winnings which the player has won when playing the line game 26 or the bonus game 30. The winnings are added to a payout total which, in turn, can be redeemed from the payout dispenser 12. If the player wishes to make another wager, the player can use the game control console 6 to make the method 20 return to step 22.

LINE GAMES 26

During the playing of either line game 26, the display 8 displays a two dimensional (2D) array 32 of fifteen icons 30 as shown, by example, in Figure 3. The icons 30 are arranged in three rows and five columns (or ranks). Each column simulates a spinning vertical reel of a traditional slot machine and the 2D array 32 simulates a viewing window for viewing a front portion of the reels. During each line game 26, the columns spin at different rates and the particular configuration of the icons 30 in the columns and the 2D array 32 change accordingly.

The 2D array 32 displayed on the display 8 is mirrored in the storage memory of the controller 4. Accordingly, the controller 4 forms, using its processor, a stored two dimensional (2D) array of icon identifiers arranged in rows and ranks. The icon identifiers are in themselves icons. Each icon identifier corresponds to an icon 30 to be displayed on the display 8. The stored 2D array (not shown) may be larger than the displayed 2D array 32 as the displayed array 32 represents a window portion of the stored 2D array which, in turn, represents the entire reels. As the size of the viewing window is limited to three rows of icons 30, and the stored 2D array can typically represent up to 30 rows, the display 8 can be used to display multiple rows piece-meal in blocks of three in the event that the player is playing more than three lines.

The icons 30 are each members of one of three categories: special (wildcard) icons, image icons and poker icons. The icons in the present embodiment are classified as indicated in the table below:

Icon Category	Descriptive Icon Name
Special	Shark, Sunken Ship
Image	Angel Fish, Lion Fish, Nautilus, Sea Turtle, Jelly Fish
Poker	J, Q, K, A

A detailed description of both line games 26a, 26b is provided below.

"Normal Lines" line game 26a

In the "normal lines" line game 26a, the display 8 displays a 2D array 32 as shown in Figure 3.

If the player has waged on one line at step 22 of wager method 20, the central row or line in the 2D array 32 is active and is used to determine whether there is a win. The player wins if the central row includes three or more identical and consecutive icons 30. The active icons 30 are regularly located within the 2D array 32 as they form a row.

Alternatively, the player may wage on more than one line at step 22 of wager method 20. In doing so, a number of consecutive rows are active and the player wins if any active row includes three or more identical and consecutive icons 30. The active icons 30 are regularly located within the 2D array 32 as they form consecutive rows.

In the example of Figure 3, the player has not won as none of the three rows includes three or more identical and consecutive icons 30.

"Bonus Lines" line game 26b

In the "bonus lines" line game 26b, the display 8 displays a 2D array 32 and an active icon map 34 (or mask) as shown in Figure 3. For the present example, the player has waged three lines at step 22 of wager method 20 and, accordingly, the three corresponding rows are concurrently displayed on display 8.

The map 34 indicates the corresponding locations of the active (and by default the inactive) icons 30 in the 2D array 32 for the present game. The active icons can be used to determine a win whereas the inactive icons cannot be used to determine a win. In the map 34, the active icon locations are shaded whereas the inactive icon locations are not shaded. In the 2D array 32, one or more icons 30 located in each rank are active icons and the other icons are inactive icons. The active icon locations are pseudo-randomly determined by the controller 4 and are scattered within the 2D array 32, and the controller 4 ensures that no more than two icons 30 located in each column may be active icons. Accordingly, the active icon locations are generally irregularly located (i.e. without symmetry, even shape, formal arrangement, etc.) within the array (as shown in Figure 3) although, by chance, may instead be regularly located (e.g. in rows). The arrangement of the icons 30 differs from game to game.

Referring to Figure 4, winning groups 35 of active icons 30 are displayed on the map. Each winning group 35 includes at least three suitable active icons 30 located in consecutive ranks. As shown in Figure 4, the suitable active icons 30 in each winning group 35 form a continuous line 36 extending across the entire 2D array 32. A winning group 35 is determined both by the player using the displayed 2D array 32, and the controller 4 using the stored and mirrored 2D array. As shown in each example of Figure 4, each line 36 is typically crooked and does not include icons 30 forming a one dimensional array within the 2D array 32. Although by chance, each line 36 may be straight and form a one dimensional array within the 2D array 32 for other instances of the game.

The current implementation of bonus lines generation is determined by the number of active play lines the player chooses to play.

Number of Play Lines selected	Number of Bonus Lines
Play 1 Line	1
Play 5 Lines	4 or 8
Play 9 Lines	8 or 16
Play 15 Lines	8 or 16
Play 25 Lines	16 or 32

For this example in Fig 3, the player waged 15 play lines, the system randomly selected a total of 16 different combinations. Of the 16 combinations, there are 4 winning combinations 36 that tally with the icons in 30 to form the winning combinations.

The determination of suitable winning groupings 35 of the active icons 30 is described in detail below with reference to the example of Figures 3 and 4.

The active Sea Turtle icons 30, located at (row 3, col. 1), (row 1, col. 2) and (row 2, col. 3), amount to wins for lines 36a and 36b shown in Figure 4. These two lines 36a, 36b each include identical active icons 30 located in the three consecutive columns one to three of the 2D array 32, and further include two additional consecutive active icons 30 so that the lines 36a, 36b span across the entire 2D array 32.

The shark icon 30 of the special icon category is a wildcard icon and can therefore be replaced by any other icon 30. Accordingly, the shark icon (i.e. having a first identity and belonging to a first category) located at (row 3, col. 2) may effectively be an alias for a sea turtle icon 30 (i.e. having a second identity and belonging to a second category). Therefore, the winning two lines 36c, 36d each include the active icons 30 located in the three consecutive columns one to three of the 2D array 32 as follows: Sea Turtle (row 3, col. 1), Shark (row 3, col. 2) and Sea Turtle (row 2, col. 3).

Therefore within the same game, the player won the Normal Lines game 1 winning line and Bonus Lines game 4 winning lines.

BONUS GAMES 30

As previously discussed with reference to Figure 2, the controller 4 executes a random one of a plurality of possible bonus games 30 at step 30 of wager method 20. In one embodiment, the randomly selected bonus game 30 may be played for three consecutive cycles of the wager method 20 before another bonus game 30 is randomly selected. The possible bonus games are described in detail below.

"Booster Pack" bonus game

In the "booster pack" bonus game, the controller 4 randomly selects a bonus set 40 of icons 30 as shown in Figure 5. The bonus set 40 may include one or more icons from the Image Icon category and/or the Poker Icon Category. During step 32 of Figure 2, the controller 4 increases the player's winnings if one or more of the icons 30 in the winning group 35 are members of the bonus set 40.

As shown in the example of Figure 5, the winning group 35 includes three Nautilus Icons 30 located at (row 1, col. 2), (row 1, col. 3) and (row 1, col. 4) of the 2D array 32 and the Nautilus icon 30 is also a member of the bonus set 40 and so the players winnings are further increased.

"Premium Scatter" bonus game;

In the "premium scatter" bonus game, the controller 4 randomly selects a bonus icon 42 as shown in Figure 6. During step 32 of Figure 2, the controller 4 increases the player's winnings if one or more of the icons 30 in the 2D array 32 match the selected bonus icon 30.

As shown in the example of Figure 6, the selected bonus icon 42 is a Nautilus Icon 30. The 2D array 32 includes three Nautilus Icons 30 located at (row 3, col. 1), (row 1, col. 2) and (row 2, col. 5) and so the players winnings are further increased in each of the three instances. The Nautilus icons 30 do not need to form a line to determine a win.

"Mystery Multiplier" bonus game

In the "mystery multiplier" bonus game, the controller 4 randomly selects a bonus flag 44 (or multiplier) which is displayed on display 8 as shown in Figure 7. During step 32 of Figure 2, the controller 4 increases the player's winnings if the randomly selected bonus flag 44 is displayed. The bonus flag 44 has an associated integer value (e.g. 2, 3, 5, etc.) and the player's winnings in the line game 26 are multiplied by that value.

As shown in the example of Figure 7, the bonus flag 44 having an associated value of 2 is displayed and therefore the player's winnings in the line game 26 are doubled.

"Symbol Evolution" bonus game

In the "symbol evolution" bonus game, the controller 4 randomly selects an evolution icon 46 which is displayed on display 8 as shown in Figure 8. Between forming the 2D array 32 during a line game 26 and determining a win in the line game 26, each instance of the selected evolution icon 46 in the 2D array 32 will evolve into (of be substituted with) the Shark wildcard icon 30. The winning group 35 is then determined in accordance with the selected line game 26.

In the example of Figure 8, the evolution icon 46 is the Jelly Fish icon 30 and each instance of the Jelly Fish icon 30 (i.e. located at row 1, col. 2) in the 2D array 32 is substituted with the Shark wildcard icon 30.

"Substitute Plus" bonus game

In the "substitute plus" bonus game, the controller 4 randomly selects one or two substitute icons 48 in the 2D array 32 and which are not members of the Special (wildcard) icon category. The controller 4 then effectively substitutes each selected substitute icon 48 located in the 2D array 32 with a wildcard icon (e.g. represented as a pearl). The winning group 35 is then determined in accordance with the selected line game 26.

In the example of Figure 9, the substitute icon 48 is the "J" icon 30 located at (row 2, col. 2) and is effectively substituted with a wildcard icon (e.g. represented as a pearl).

Further embodiments

In the first embodiment, the user could select whether to play either the "normal lines" line game 26a or the "bonus lines" line game 26b. In a second embodiment of the present invention, the user may instead always play the "normal lines" line game 26a and may have the further option to play the "bonus lines" line game 26b as shown in Figure 11. In this manner, the "normal lines" line game 26a and the "bonus lines" line game 26b are serially played.

In the second embodiment with the example shown in Figure 3, the combination of the Turtle icon 30 located at (3,1), the Shark (wildcard) icon 30 located at (3,2) and the Turtle icon 30 located at (2,3) results in a win.

A person skilled in the art will appreciate that many embodiments and variations can be made without departing from the ambit of the present invention.

In the preferred embodiment, the video gaming machine 2 is a stand alone computational device which is suitable for locating in a gambling venue. According to a further embodiment of the present invention, the gaming

machine may instead be an online gaming machine. In this manner, the online gaming machine 60 may include a remote server 62 (i.e. a first computational device) which interfaces with a player's personal computer 64 (i.e. a second computational device) via the Internet 66 as shown in Figure 10.

The step of calculating winning amounts based upon wins during the games 26, 30 is arbitrary. The winning amounts may be varied to yield a desired ratio of wagered amount to payout amount.

In the preferred embodiment, the bonus game was always enabled at step 28 and the particular bonus game played was randomly selected. In another embodiment, the bonus game feature may not be enabled. In yet another embodiment, the player may select which bonus game to play and may wager additional money to play the selected bonus game.

In the "bonus lines" line game 26b of the preferred embodiment, the active icons may, by chance, be regularly located to form rows within the 2D array 32. In an alternative embodiment, the controller 4 may ensure that the active icons are never regularly located within the 2D array 34 (i.e. by choice). In yet another embodiment, the controller 4 may ensure that at least some of the active icons are always regularly located in rows within the 2D array 34 (i.e. by choice).

In one embodiment, the map 34 may be superposed with the 2D array 34 whereby the active icons 20 are clearly highlighted within the 2D array 34.

In the preferred embodiment, the winning line 36 of active icons 30 extended entirely across the 2D array 32 to determine a win. That is, if a continuous line of active icons 30 could not be formed to extend across the entire array 32, there was no possibility of a win irrespective of the identity of the icons 30. In an alternative embodiment, the winning line of active icons 30 need not extend entirely across the 2D array 32, and therefore a win is possible if there is no active icon 30 in a column of the array 32.

In the bonus lines line game 26b of the preferred embodiment, four winning groups 35 of active icons 30 are displayed on the map (Figure 4). In an alternative embodiment, more than four winning groups 35 (e.g. sixteen) may be displayed in a piece-meal manner.

In compliance with the statute, the invention has been described in language more or less specific to structural or methodical features. It is to be understood that the invention is not limited to specific features shown or described since the means herein described comprises preferred forms of putting the invention into effect. The invention is, therefore, claimed in any of its forms or modifications within the proper scope of the appended claims appropriately interpreted by those skilled in the art.

The claims defining the invention are as follows:

1. A method for determining a win on a gaming machine, the method involving the steps of:

forming, using at least one computational device, a two dimensional (2D) array of icons arranged in rows and ranks whereby some of the icons are active icons able to have been irregularly located within the 2D array and the other icons are inactive icons; and

determining the win using a group of active icons which are located in consecutive ranks.

2. A method as claimed in claim 1, wherein the step of determining involves identifying the group which includes active icons located in consecutive ranks that form a line.

3. A method as claimed in claim 2, wherein the line can be nonlinear.

4. A method as claimed in claim 2, wherein the line spans the entire 2D array.

5. A method as claimed in claim 1, wherein the step of forming involves forming the 2D array in a memory device.

6. A method as claimed in claim 1, wherein the step of forming involves forming the 2D array on a display.

7. A method as claimed in claim 6, further including the step of displaying, on the display, a map indicating the location of the active and inactive icons on the display.

8. A method as claimed in claim 7, wherein the map is not superposed with the 2D array.

9. A method as claimed in claim 1, further including the step of concurrently displaying the entire 2D array.

10. A method as claimed in claim 1, wherein the group must include an active icon from every rank in the array to determine the win.

11. A method as claimed in claim 1, wherein the active icons are randomly or pseudo-randomly located within the 2D array.

12. A method as claimed in claim 1, wherein the active icons are also able to have been regularly located within the 2D array, whether by choice or by chance.

13. A method as claimed in claim 1, wherein the group includes identical active icons located in the consecutive ranks.

14. A method as claimed in claim 1, wherein the step of determining involves grouping active icons located in the consecutive ranks to form the group, whereby one or more of the grouped icons have a first identity and the other grouped icons have a second identity.

15. A method as claimed in claim 1, wherein the icons are each members of a respective one of a plurality of icon categories, and the group includes identical active icons which are members of one category and one or more active icons which are members of another category.

16. A method as claimed in claim 1, wherein the step of determining involves grouping icons in at least three consecutive ranks to form the group.

17. A method as claimed in claim 1 wherein, on a display, the rows are horizontally arranged and the ranks are columns which are vertically arranged.

18. A method as claimed in claim 1, further including the step of calculating winnings based upon the determined win.

19. A method as claimed in claim 18, wherein the step of calculating involves increasing the winnings if one or more of the active icons in the group are members of a bonus set of icons.

20. A method as claimed in claim 18, wherein the step of calculating involves increasing the winnings if one or more of the icons in the 2D array match a selected bonus icon.

21. A method as claimed in claim 18, wherein the step of calculating involves increasing the winnings if a random bonus flag is displayed.

22. A method as claimed in claim 1 wherein, between the steps of forming the 2D array and determining the win, the method further includes the step of substituting one or more icons in the formed 2D array with another icon.

23. A method as claimed in claim 22, wherein the step of substituting involves substituting each instance of a randomly selected icon in the 2D array with the other icon.

24. A method as claimed in claim 22, wherein the step of substituting involves substituting one or more array icons at respective randomly determined locations in the 2D array with the other icon.

25. A method as claimed in claim 23 or 24, wherein the other icon is a wildcard icon.

26. A method for determining a win on a gaming machine, the method involving the steps of:

forming, using at least one computational device, a two dimensional (2D) array of icons arranged in rows and ranks whereby some of the icons are active icons and the other icons are inactive icons; and

determining the win using a group of active icons which are located in consecutive ranks whereby the group is able to not form a one dimensional array in the 2D array.

27. A gaming machine, or at least one computational device, loaded with computer readable instructions for execution by one or more processors to thereby perform a method as claimed in any one or more of the preceding claims.

28. A media, such as a magnetic or optical disk or solid state memory, containing computer readable instructions for execution by one or more processors to thereby perform a method as claimed in any one or more of claims 1 to 26.