A simulated golf environment including a plurality of golf game simulator devices wherein at least one player uses a number of the simulator devices to play successive holes of a simulated golf course.
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
A SIMULATED GOLFING ENVIRONMENT AND GAME

FIELD OF THE INVENTION

The present invention relates to simulations of games and particularly to more realistic simulations of a game and the entire environment in which it is played.

BACKGROUND ART

A standard golf game is played on an outdoor turf course which includes fairways for taking shots with woods and irons and putting greens for putting with putters. A number of holes, each including a tee area, a fairway and a green area, must be played successively and the player with the lowest score for the holes wins the game. The players walk over the holes and many play the game as a social outlet as well as for competition.

One of the particular disadvantages of the game of golf is the very large space it requires which can make it very expensive where land is at a premium and/or require extensive travel from a city to a more or less remote golf course. In recent years, various golf simulators have been developed which can provide some elements of realism by using projected images of a player's view of a golf course and of the ball's estimated position after it has been hit by a player. Various kinds of sensors are used to monitor the flight of the ball and/or the trajectory of the golf club head and use the captured data to estimate the trajectory which the ball would have followed out in the unconfined space of the real golf course. With such simulators, it is quite possible to "experience" playing holes from golf courses from all around the world in a small confined space which can readily be accommodated in the centre of a city or any other convenient location.

One example of such a device is disclosed in U.S. Patent No. 4,150,825 to Wilson for a golf game simulating apparatus. According to the Wilson invention, an enclosure is provided into which a golfer can drive a ball against a screen and the image of a fairway is projected onto the screen. Prior to hitting the screen, the ball travels through three planes that are bound by three sets of motion sensors. The sensors provide a signal to the computer when the ball passes through their respective plane. Based upon the signal from the sensors, the computer determines the trajectory the ball would have had if the ball had not been stopped by the screen. The computer then causes a video image of the ball to be projected on the screen illustrating the
ball's travel down the fairway.

The arrangements thus far proposed typically include a tee area from which a player may drive a ball and a target screen for receiving the ball and upon which is projected scenes of an actual golf course as viewed from successive locations of the lie of a golf ball looking toward the greens. Various sensing systems are utilized to determine the initial trajectory and speed of the ball, which information is then used to compute an estimate of how far the ball would have travelled had it not struck the target screen. The sensing systems generally employ, either singularly or in combination, photo-electric devices, acoustic pick-up devices or impact-detection devices for determining the path of a driven golf ball. Most often, two sensing devices are used, a first of which detects when the ball leaves a tee point or passes a plane near the tee point and a second of which is spaced along the line of flight of the ball at a location to detect passage of the ball through that location. The time between detection by the first sensing device and the second sensing device, of course, can be used to ascertain the initial speed of the ball. Additionally, depending upon the nature of the sensing devices, information such as the azimuth and trajectory angle of the ball (with respect to elevation) may be determinable and thereafter used by computing apparatus to compute an estimate of how far the ball would have travelled and the location at which the ball would have come to rest had it not struck the target screen. These estimates are then used to ascertain which scene should be projected on the target screen, with the scene chosen reflecting the estimated lie of the golf ball with respect to the green.

Some exemplary prior art arrangements are disclosed in U.S. Pat. Nos. 3,591,184, 3,778,064, 3,655,202, 3,671,724, 3,712,624 and 3,759,528.

The game of golf is different when not played on a real course. It would therefore be a valuable contribution to the art if a more realistic simulation of the experience of playing a round of golf could be created whilst maintaining the ability to produce the experience in a reduced area.

It is therefore an object of the present invention to provide a simulated golf environment in which golf players can play a simulated game of golf but still interact with other players in the manner of a "real" round of golf, whilst doing so in a dramatically reduced area.
OBJECT OF THE INVENTION

The present invention is directed to a simulated golf environment, which may at least partially overcome the abovementioned disadvantages or provide the consumer with a useful or commercial choice.

In one form, the invention resides in a simulated golf environment including a plurality of golf game simulator devices wherein at least one player uses a number of the simulator devices to play successive holes of a simulated golf course.

The present invention provides a player with a complete golfing experience including practising prior to playing a round of golf and particularly provides a social aspect whilst playing the round of golf that is not possible with prior art golf simulations. The present invention is intended to operate on a basis similar to a golf-theme park where a user can play a round of golf and then relax in a restaurant or cafe or bar. It is also anticipated that a store selling golfing equipment will be located in the environment to increase the value of the experience. Other services may be provided such as conference rooms.

There will typically be a practice putting green in the environment so that users can practise their putting prior to playing. The present invention is intended to simulate the entire experience of playing a round of golf but in a much smaller, more compact, simulated environment. The present invention is distinguishable from games played in the home, on gaming consoles, on the basis that the players use real golf equipment and actually physically swing the clubs.

Player use real golf clubs, hit real golf balls and the simulator devices will preferably display the position of the ball on a simulated golf hole which includes all of the features of a real golf hole. There are preferably a number of simulator devices provided in the environment and a player will play a simulated golf hole on a first simulator and then move to the next simulator device for their next hole. Each of the simulator devices will be separated about an area and the players will move between the simulator devices upon completion of the previous hole to more realistically simulate the game of golf. There will suitably be multiples of nine simulator devices. There may be one or more practice, teaching or analysis simulator devices in the environment as well.

The present invention will be provided in two main portions, namely a hardware portion which will include the physical features and surroundings of the
golfing environment and a software or functional component which will include the manner in which the simulated experience is managed on the simulator devices and their functional aspects.

The hardware portion of the invention preferably includes a building or room in a building which includes a plurality of simulator devices. According to the invention, each of the plurality of simulator devices is linked to and may be managed by, a central control system. The environment is preferably managed using a distributed control pattern managed from the central control system, similar to the manner in which a computer network may operate. The system architecture may preferably be such that the simulated golf game can be played by a number of players at a single site or a number of players at a number of different and separate sites linked over a computer network such as the World Wide Web or an intranet. For example, a tournament may be played in a variety of physical locations but linked over the system of the present invention so that players in different locations can all play the same tournament.

Each simulator device may be one of any known or new type. There are many simulator devices which are currently available and any of these, or combination of these, may be used.

Typically, each simulator device will include at least one tee surface or area, a ball flight path analyzer, a computer processor, projection means and a projection screen. The ball flight analyzer will be capable of simulating balls in flight as well as along the ground.

Each simulator device may include more than one tee surface in order to more fully simulate the variety of playing surfaces encountered by a player on a real golf course. Real golf courses have "tee boxes", fairways grass cut to a given length, one or more "rough" areas outside the fairways which often have longer grass which is more difficult to hit from and there are often also bunkers filled with sand. The tee area of each simulator device may be provided with three surfaces for example, one of "fairway" length grass (or substitute), one of longer grass (or substitute) length to simulate "rough" and a third of sand (or substitute) to simulate a bunker shot.

It is preferred that the ball flight analyser, computer processor and projection means will be mounted in a location that will not interfere with the player's golfing experience by being easily recognisable. For example, the projection means
may be roof mounted and the other components may be hidden from view or in housings disguised to appear as a part of the simulated landscape. The computer processor discussed as a part of the simulator devices is typically limited to the control of the projection means and the ball flight analyser in order to simulate the ball flight and landing position. If required, the operation of each simulator device may be more directly controlled by a central control system as discussed below.

The projection screen used in each simulator device may be of any size between approximately 1m in height and 1m in width up to a 5m x 5m screen but typically will be approx 3m high by 4 to 5m wide. The screen used will generally be quite large in order to project a large view of the simulated golf hole being played but also so that the simulated ball can be watched in flight (simulated) as on a real golf hole.

According to an embodiment of the present invention, the tee areas for each simulator device will preferably be linked by a path for cart or walking. This path will typically extend through natural park-like setting including ponds or water features, again in order to better simulate a real golf course and make the experience of playing on the simulated golf course as real as possible.

The central control system is preferably a distributed control system (DCS) which will generally not require operator intervention for the normal operation of the simulator devices but the DCS may have an associated or incorporated supervisory control and data acquisition (SCADA) system which may permit operator interaction with, and control of, the simulator devices via the SCADA system.

A DCS normally consists of field instruments; in this case, the simulator devices connected via a communication infrastructure to a control Human-Machine Interface (HMI) or control console. A DCS is a preferably a control system that uses a network to interconnect the simulator devices with the central control system and the control HMI. A DCS typically contains a single computer for control and may use proprietary communication infrastructure.

The three main components of the hardware control system of the present invention are:

1. a plurality of remote terminal units (RTU’s) each of which is in turn associated with a simulator device;
2. a central control system (CCS) with HMI; and
3. communication infrastructure between each of the RTU's and the CCS.

According to the invention, each RTU has an associated simulator device. Each RTU allows the central control system to communicate with its associated simulator device. As the term SCADA implies, the central control system may preferably allow for "supervisory level" control of the remote simulator device. The bulk of the actual projection or display functionality may typically be performed automatically by the computer processor of the simulator devices, whilst the central computer in the distributed control system will control the interconnectivity of the simulator devices and what information is displayed which is keyed to each player. Central control functions may be restricted to basic remote site over-ride or supervisory level capability or may be more advanced, making the RTU processors more like slave terminals, merely following the instructions of the central computer. Data acquisition begins at the RTU/simulator device level and includes readings and equipment status that are communicated to the SCADA system and thence to the central control system, as required. Data is then compiled and formatted in such a way that a control operator using the SCADA system can make appropriate supervisory decisions that may be required to over-ride normal simulator device controls. In this manner, the central control system may be a master control and the computer processors of the simulator devices may be slave terminals.

The HMI is typically a user-friendly front-end to a control system embedded in or run on a central control computer or network associated with the RTU's and simulator devices. The RTU's may include the computer processor of the simulator devices and may have a programmable element. While a programmable RTU may provide automated, pre-programmed control over a simulator device, the simulator devices will usually be distributed across a large area to simulate the golf course, making it difficult to gather data from them manually. In addition to that, the information provided by the RTU's or the simulator computer processors will usually be transmitted in a crude non user-friendly format. The HMI/SCADA system will typically gather information from the RTU's and simulator devices via the communication infrastructure, format and combine the information into a useable form. Use of "smart" RTU's, which are capable of autonomously executing simple logic processes without involving the central computer, is increasing and may be used according to the invention.
7

The CCS will typically include a central control computer or network associated with each of the RTU’s and simulator devices provided. The central control computer will therefore be associated with information storage means, generally one or more databases containing information required to identify players, courses to be simulated, course condition modifying information allowing the course to be played when raining for example and historical information as well as demographic and statistical information.

The HMI usually presents information relating to each of the RTU’s and simulator devices in the form of a mimic. This means that the operator can see a representation of the RTU/simulator device being controlled. These representations can be as simple as an image or a coloured simulation which represents the state of an actual simulator device in the field, or as complex as a multi-projector display representing the positions of all of the simulator devices in the environment. The interface is usually two-dimensional. The central control system HMI may display the status of each RTU/simulator device, what group or player is on which simulator device, the time that the player or group has taken on that simulator device and an estimate of the time remaining for that hole.

The central control computer or network may have a HMI which is a control interface whereas each RTU/simulator device will typically have a slave interface which can display information but not be used to change any information.

The system can use a communication infrastructure appropriate to the situation including wireless such as radio signals, direct serial or modem connections to meet communication requirements, and Ethernet communication may be used. The protocol for communication using the communication infrastructure may be designed to communicate constantly with the central control system or to send information to the central control system only when the central control system polls the RTU. Communications may be event driven. The communications infrastructure may include any one or more of the following devices: embedded device servers such as integrated modules, board level modules or single chip solutions or external device servers. The infrastructure may use RS232 serial operations or USB devices.

The central control system (and also the control HMI) is generally associated with a Reception area or Check-in area in the environment.

Terminal servers may be one method of connecting serial RTU’s and
simulator devices to a network for accessing a multi-user hosting system. The software component of the system may be active on the terminal server governing protocol use. This may allow the availability of add-on or upgrade features to each of the RTU's and simulator devices once the terminal server or network has been updated.

Importantly, the system of the present invention will be provided with redundant hardware and communications channels. A failing part of the system can then be quickly identified and its functionally automatically taken over by backup hardware. A failed part can also be replaced without interrupting the process.

When playing the game, the preferred sequence of events will be as follows:

1. Customers/players fill out player form to obtain a player identification means either each time they play or the first time they play for repeated users. These forms are retained at the reception portion of the simulated golf environment. At each visit, the player identifies the course to be played and the mode of play required.

2. At reception, the players' information is transferred to the main control system of the simulated golf environment and keyed to particular player identification means which is issued to the player through the use of appropriate storage means.

3. The players carry the identification means through each of the holes played in the environment and the identification means is used to identify the players to the successive simulator devices.

4. The player identification means, through communication with the central computer system, tracks the player through the successive holes and loads the player's preferred hole into the simulator for play. It will preferably also maintain and display upon request, the particulars of the hole and score for the player similar to a scorecard.

   a. When a hole station is vacant, the player approaches the station and the identification means is used to identify the player.

   b. The identification means reader will transmit the player identification information to the central control system.

   c. The central control system will then query the player information from
the control database.

d. When the control database record is located, the central control system will then load the hole information corresponding with the player identification information onto the vacant station corresponding with the recorded player identification means.

e. When the hole is completed, the station simulator device will then update the control system on the completion of the hole and the player then moves to the next station.

f. An advertising display will be loaded based on the player identification means when the hole is completed.

The system of the present invention also provides that players be issued with identification means. The identification means will preferably be one of two main types, namely either one that requires physical contact for activating the RTU/simulator device or one that is contactless. An example of the former type are card-like devices that include a magnetic strip for the storage of information thereon and examples of the latter type are smart cards or RFID devices.

The identification means may be used at the RTUs/simulator devices to activate the required RTU/simulator device for play. Each RTU/simulator device will preferably be provided with a reading device capable of accessing information which may be stored on the identification means. The reading device may be a card swipe reader or other reader for the identification means requiring physical contact. Contactless systems may use suitable readers. It is preferred that the system of the invention will use a contactless interaction but it is anticipated that in the early stages of use, physical contact systems such as the magnetic strip swipe cards can be used.

As the system develops, it is anticipated that both contact and contactless systems will find use in the present invention, the contactless system as the main system and the contact system as a backup system.

One of the main advantages of a contactless system, particularly on operating on the basis of RFDD or similar, is that the RTUs/simulator devices can be activated on the basis of proximity of the identification means to the simulator device. For example, as a player approaches a simulator device, the RTU/simulator device and its reader may read the information on the identification means to load the appropriate simulated golf hole so that play can commence immediately upon the
player's arrival at the simulator device.

The identification means may have information storage capacity via a storage means. Storage means such as EPROM, EEPROM or flash memory or similar may be used. The information on the identification means may be used to access player specific information stored on the central control system so that the RTU/simulator device can request the transfer of information to the RTU/simulator device relating to the golf hole to be played at that simulator and update the central control system after the golf hole has been played or this information may be stored (and updated) on the identification means itself. Preferably, the information wherever stored is updated at the end of each hole played. This may require information writing means at each RTU/simulator device.

The information which may be used by the RTU/simulator device and updated will typically include information such as player name data, score card data and course data, but this will be discussed more fully below.

At Reception or Check-in, a player may choose a course and the identifier for that course may be loaded on the player's identification means. This may occur by writing to the identification means storage means as may occur with updating of information for any purpose.

The software component of the present invention may provide functionality similar to that offered by similar conventional simulation programs. Whilst not wishing to be limited, the following discussion provides some basic software functions.

The simulation software may allow a player to choose to simulate play on a real golf course simulated for the game or a series of real holes chosen from a number of golf courses, as a combination golf course.

The software may allow play in practice mode as well as a playing mode. The practice mode will typically be accessible on a practice simulator device associated with the main system, which is separate from the playing simulator devices. The practice simulator device will typically be used for player swing analysis for teaching and/or learning purposes and/or for warm-up or pre-practice purposes.

The player may be able to practise a hole, go to a simulated driving range or putting green at the practice simulator device. Of course, a conventional practice putting green will normally be provided in the environment.
The practice mode is also preferably accessible in the playing simulator devices provided that the players can indicate a practice swing to the simulator device, such as by using pressure pads in the tee area to determine whether a play is addressing the ball or having a practice swing.

Course selection may take place at the arrival of each player. This may take place at Reception or Check-in and may be performed by the operator for example by scrolling through a list of available golf courses stored on a database and selecting one of them. In addition to the course to be played, the player may also be able to select to play any number of holes in any grouping from one or more available courses. The player may be able to select the tee position from which to play, for example white for beginners or social golfers, blue for male "members" red for lady golfers and black for professional or low handicap golfers.

Players may also be able to nominate the position of the flag on each green to make the hole easy, moderate, difficult or very difficult. Players may be able to choose weather conditions to be simulated such as stormy, showers, neutral, dry or very dry as this will also affect the hole. A particularly preferred course condition that can be set by the player may be the wind condition from calm to strong winds. The wind direction may be automatically and randomly selected for a hole or for a course being played and the software may be capable of changing the wind direction to suit the direction of the hole on the course being played.

The software will preferably display certain information for each shot for each player which may be viewed by the player. The information displayed may include any one or more of the player's name and current stroke number on that hole, the player's score, the par of the current hole, the distance to the flag on the hole being played, the elevation of the flag in relation to the player's position on the simulated hole, the wind direction and speed, the lie of the ball, the club selected and its maximum distance. This information may be displayed on the display of the simulated hole or on an interface on the RTU or similar so that the view projected on the screen is only of the simulated hole. The player may be required to advise the RTU/simulator device of the club to be used for each shot or the ball flight analyser may be capable of calculating the distance and elevation of the shot regardless of club used.

The simulated golf game may be playable in any of the different modes or rules of play under which a normal golf game may be played such as any one of the
following:

**Single Stroke**

Single Stroke or Medal play is the simplest of all variations. The game requires all strokes to be counted and players are unable to pick up the ball without penalty. The score for the 18 holes is tallied and the handicap is deducted from that total. The lowest score wins, both for gross and nett.

**Four-Ball Best-Ball Stroke**

Played the same as the single version but you have a partner. The best nett score on each hole is used and only the gross and the best nett need to be scored on each hole. Once a player cannot beat his partner's nett score, the ball should be picked up. If both players record the same nett score, the player who first holed-out is marked on the card as scoring.

Both players' names and handicaps must be on the card. The card need only be signed by one marker and one player from each pair. The lowest point score wins.

**Single Stableford**

Each player scores stableford points on a hole based on their handicap and the stroke index for the hole. During the round, each player and marker has to calculate the points allocated to each score on a hole based on the stroke index. A player on a handicap of 12 receives a shot on the 12 hardest holes, while a player on a 27 handicap receives 2 shots on 9 holes and 1 shot on 9 holes, based on the course index.

<table>
<thead>
<tr>
<th>SCORE</th>
<th>Points with no shots</th>
<th>Points with one shot</th>
<th>Points with two shots</th>
<th>Points with three shots</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 under par</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>2 under par</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>1 under par</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>PAR</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>1 over par</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2 over par</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3 over par</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4 over par</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>&gt; 4 over par</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
You mark both the stroke score and stableford points on the card and the highest point score wins. Only the stableford points are tallied.

**Four-Ball Best-Ball Stableford**

The team version of a single stableford. The scoring is the same as the single event but only one player can score for each team on a hole. The score is the best result in the team. When the two partners score the same result, the score is marked for the player who holes out first. If a player cannot beat the partner’s score, the ball is picked up to speed up play.

The stableford points only are tallied and the highest score wins. Only one player and one marker from each team need sign the card.

**Four-Ball Aggregate Stableford.**

A team version of single stableford where all scores count on every hole. Each player must record a score on each hole and the scores of both players are added together for the total points each hole. The result for the round is then calculated and recording by adding the total point scores for each hole. The points scoring system is the same for a single stableford.

The highest point score wins the competition.

**Single Versus Par (VSS)**

Scores are recorded only as plus (+), Minus (-) or halved (0). The easiest way to understand it is to compare it with stableford scoring.

<table>
<thead>
<tr>
<th>STABLEFORD POINTS</th>
<th>VERSUS PAR RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 points or greater</td>
<td>Plus (+)</td>
</tr>
<tr>
<td>2 points</td>
<td>0</td>
</tr>
<tr>
<td>Less than 2 points</td>
<td>Minus(-)</td>
</tr>
</tbody>
</table>

The scores are recorded by marking down the player's stroke score with the appropriate symbol (+/-/ 0). If a player is unable to score a Plus (+) or Half (0) then the player should pick up and mark the hole as Minus (-). The final score is calculated by comparing the pluses and minuses as they negate each other. Thus a player with 6 pluses and 3 minuses would score 3 for the round.

The highest score wins the competition.
Four-Ball Best-Ball Versus Par

Played under the same rules as the single version but this team game allows both partners to contribute according to their handicaps and score on a hole.

Only the best result on each hole is counted and if the two players have the same result only the score of the player who holes out first needs to be recorded.

The highest score wins the competition.

Ambrose

Ambrose is played in teams of two, three or four. The team selects a captain on the tee (usually the lowest marker) and they decide on the order of play. Every subsequent shot must be played in the same order. The players then play a shot from the tee and proceed to their ball. The captain then decides on the best positioned ball and the other players retrieve their balls.

The player whose ball was chosen has the first shot and then each remaining player drops their ball within one club length of the spot, but no nearer the hole, and plays their next shot in the order originally decided by the captain. This procedure continues irrespective of whether the ball is on the fairway, in the rough or in a hazard, until the play reaches the green.

On the green, the best position is again decided upon and marked. Each player then places their ball within a card length of this spot and has one putt in turn. They must not putt out but each ball position must again be marked and the procedure repeated until a ball is holed or a score cannot be bettered.

The card is marked as for a single stroke round and the lowest score wins the competition. It is important to note that every player must have their handicap marked on the card. Only one score is kept for the entire team, regardless of the number of members. Handicaps are calculated by adding those of all players and dividing the total by: 4 in a two-ball event, 6 in a three-ball event and 8 in a four-ball event. The nett score is calculated by subtracting the exact resulting handicap so all those fractions count.

Foursomes

This is a team game played in pairs with only one ball in play. Players alternate between shots after teeing off. The tee shots are also taken alternately so that one player tees off on all the even numbered holes and the other player tees off on all the odd numbered holes.
In mixed competitions, ladies tee off from their own tees. It is played and recorded as if a single stroke event. The handicaps of both players are added and half the total is the team handicap for the day. The order of play is not changed if a player incurs a penalty.

5 **Canadian Foursomes**
Played on half combined handicaps. The players both tee off every hole and then select the best positioned ball to play alternately from there. Rules are the same as for foursomes.

**American Foursomes**
Similar to the Canadian foursomes on half combined handicap. After the tee shot, players play their partner's ball then select one ball to play alternately until holed.

**Chapman Foursomes**
Similar to American Foursomes but the second shots on each hole are played with their own ball and then the selection made. Again, half combined handicaps are used.

**Matchplay**
Holes are either won, halved or lost, based on the nett score of each hole. The handicap is applied using the matchplay index on the scorecard. The two competitors' handicaps are compared and the difference e.g. 14 - 6 = 8, is the number of strokes given away. The number of holes where one stroke is allocated is then decided according to the match index.

When a player is ahead on wins more than there are holes left to play, that player is declared the winner. It is important to remember in matchplay that the player furthestmost from the hole always plays first. This is especially true on the putting green. You must not putt out if your opponent's ball is still "live" and furthest away from the cup.

You may pick your ball up if your opponent is heard to "give you the putt". The scorecard is generally not used.

**Four-Ball Handicap** Matchplay
The rules are the same as with single matchplay, but the handicap differences are based on the lowest handicapped player in the two pairs.

The lowest marker goes back to scratch. The other players have their handicaps lowered by subtracting the handicap of the low marker. For example, four players with the following handicaps would be treated like this.
C is the low marker and would have a new handicap of Zero.
The other new matchplay handicaps would then be:

A: 15 handicap
B: 13 handicap
C: 3 handicap
D: 22 handicap

The side which wins a hole is then the side with the best nett score on a hole after comparing the adjusted matchplay handicaps to the matchplay index on the holes (see Matchplay)

**Flag Competitions**

A player or side is allocated a set number of shots based on the total of their handicap and par for the course. For example, a player on a handicap of 14 would have 85 shots if the par for the course is 71.

The object of the game is to play every shot until you run out of shots. The winner is the player who gets the furthest around the course or furthest past the first tee if they have shots left after 18 holes. A flag is generally used as a marker to designate the finishing point.

**Bisque Bogey**

In this game, the competitor is allowed to choose on the tee before the start of each hole whether or not they will allocate any shots to the hole. The competitor must mark on the card how many shots are to be used before starting the hole. Once the handicap is used up, no more shots can be allocated. Scoring is based on Single Versus Par.

According to the present invention, the software will also have functionality which is not represented in conventional simulated games in order to
allow more control over the environment. Functionality such as timing of rounds and holes to minimize slow play and players being forced to wait on the availability of simulator devices. The control system may suspend a game if players are taking a long time to complete a hole or round. The central control system may incorporate a real-time clock to track progress. Where the allocated time for a hole is passed, a warning may be displayed.

In times when no player is active on a simulator device, the central control system may cause advertising media to be displayed on the simulator device through the projection means. Simple switching technology may allow separate input devices to be used to display either advertising or the simulated game.

Each simulator device and/or RTU may have an alert function to alert the central control system and/or operator that assistance is required. For example, the alert function may be used by the players to signal that they wish to purchase food or beverages. Using the alert function may allow the players to summon a member of the service personnel to order their food or beverage(s).

There may be provision of an electronic Scoreboard capable of displaying scores. This may particularly add to the enjoyment of the game if a group of players wish to play a simulated tournament. A centralized updateable leaderboard may be provided and linked to the central control system to allow the scores of each of the players to be displayed thereon. This board would preferably be visible from different locations in the environment and may be updated from the central control network at the end of or as players complete successive holes. The Scoreboard also offers functionality similar to that of a ten pin bowling league where teams of players compete against each other over a set number of weeks or holes.

Due to the electronic and interconnected nature of the invention, it also allows itself to be connected to a website accessible through a global computer network. This may allow remote sign up for tee times, tournament information and sign ups.

The above discussion gives a broad description of some typical features and function but the invention is not to be limited to these features or functions. Indeed, the above description and the preferred embodiment described below are described in terms of a golf game but it may be recognized by a person skilled in the art that the system of the present invention is readily adaptable to other games or
sporting contests.

BRIEF DESCRIPTION OF THE DRAWINGS

Various embodiments of the invention will be described with reference to the following drawings, in which:

Figure 1 is a schematic view of a physical layout of a simulated golf environment according to a preferred embodiment of the present invention.

Figure 2 is a schematic view of a distributed control system for the simulated golf environment illustrated in Figure 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In its most preferred form, the present invention provides a simulated golf environment.

The simulated golf environment includes a plurality of golf game simulator devices wherein a player uses successive simulator devices to play successive holes of a simulated golf course, moving from one simulator device to the next.

The simulated environment, a preferred embodiment of which is illustrated in Figure 1, provides a player with a complete golfing experience including practising on a practice simulator device 11 prior to playing a round of golf and particularly provides a social aspect whilst playing the round of golf than is possible with prior art golf simulators. The present invention is intended to operate on a basis similar to a golf-theme park where a user can play a round of golf and then relax in a restaurant or cafe 12 or bar 13. It is also anticipated that a store 14 selling golfing equipment will be located in the environment to increase the value of the experience. There will typically be a practice putting green 15 in the environment so that users can practise their putting prior to playing. The present invention is intended to simulate the entire experience of playing a round of golf but in a much smaller, more compact, simulated environment.

Players use real golf clubs, hit real golf balls and the simulator devices will preferably display the position of the ball on a simulated golf hole which includes all of the features of a real golf hole. According to the embodiment illustrated in Figure 1, there are nine playing simulators 10 and one practice simulator 11 provided in the environment and a player plays a simulated golf hole on a first simulator 10 and then moves to the next simulator device 10 for their next hole. The player does not
have to start on the simulator device marked as #1 but can begin play on any available simulator device. Each of the simulator devices 10 is separated about the area and the players move between the simulator devices 10 upon completion of the previous hole to more realistically simulate the game of golf.

The hardware portion of the invention includes a building including a plurality of simulator devices 10 as illustrated in Figure 1. According to the invention, each of the plurality of remote simulator devices 10 is linked to and managed by, a central control system from Reception 16. The preferred embodiment of the environment is managed using a distributed control pattern managed from the central control system at Reception similar to the manner in which a computer network operates and as illustrated in Figure 2.

Each simulator device will include at least one tee area, a ball flight path analyzer, a computer processor, projection means and a projection screen.

The projection screen used in each simulator device is approx 3m high by 4 to 5m wide. The screen used is quite large in order to project a large view of the simulated golf hole being played but also so that the simulated ball can be watched in flight (simulated) as on a real golf hole.

According to the embodiment illustrated, the tee areas for each simulator device 10 are linked by a path 17 for cart or walking. This path 17 extends through natural park-like setting including real and/or artificial trees, plants and landscaping, ponds or water features, again in order to better simulate a real golf course.

The preferred embodiment uses a distributed control system (DCS), a version of which is illustrated in Figure 2, which will not require operator intervention for the normal operation of the simulator devices 10, but the DCS will have an associated or incorporated supervisory control and data acquisition (SCADA) system which permits operator interaction with, and control of, the simulator devices 10 via the SCADA system.

The DCS of the preferred embodiment consists of field instruments, in this case, the simulator devices 10 connected via a communication infrastructure (indicated by lines in Figure 2) to a control computer 18 with a Human-Machine Interface (HMI) or control console. The DCS is a preferably a control system that uses an ethernet network to interconnect the simulator devices 10 with the central control
system and the control computer 18 and HMI.

The three main components of the hardware control system illustrated in Figure 2 are:

1. a plurality of remote terminal units (RTU’s) 19 each of which is in room associated with a simulator device 10;
2. a central control computer 18 with HMI; and
3. communication infrastructure between each of the RTU’s 19 and the central computer 18.

According to the embodiment illustrated, each RTU 19 has an associated simulator device 10. Each RTU 19 allows the central control computer 18 to communicate with the simulator device 10. As the term SCADA implies, the central control computer 18 allows for "supervisory level" control of the remote simulator devices 10. The bulk of the functionality is typically actually performed automatically by the computer processor of the respective simulator devices 10.

Central control functions will usually be restricted to basic remote site over-ride or supervisory level capability. Data acquisition begins at the RTU 19/simulator 10 level and includes readings and equipment status that are communicated to the SCADA system and thence to the central control computer 18, as required. Data is then compiled and formatted in such a way that a control operator using the SCADA system can make appropriate supervisory decisions that may be required to over-ride normal simulator controls controls. In this manner, the central control computer 18 is a master control and the simulator computer processors may be slave terminals.

The central control computer 18 or network associated with each of the RTU’s 19 and simulator devices 10 provided is associated with information storage means, generally one or more databases containing information required to identify players, courses to be simulated, course condition modifying information allowing the course to be played when raining for example, and historical information as well as demographic and statistical information.

The HMI presents information relating to each of the RTU’s 19 and simulator devices 10 in the form of a mimic. This means that the operator can see a representation of the RTU 19/simulator device 10 being controlled. The central control system HMI can display the status of each RTU 19/simulator device 10, what group or player is on which simulator device 10, the time that the player or group has
taken on that simulator device 10 and an estimate of the time remaining for that hole.

The central control computer 18 has an HMI which is a control interface whereas each RTU 19/simulator device 10 will have a slave interface, which can display information, but not be used to change any information.

The system can use a communication infrastructure appropriate to the situation including wireless such as radio signals, direct serial or modem connections to meet communication requirements, and Ethernet communication can be used at large sites. The communication infrastructure may be designed to communicate constantly with the central control computer 18.

When playing the game, the preferred sequence of events will be as follows:

1. Customers/players fill out a player form to obtain a player identification means, normally a swipe card, either each time they play or the first time they play for repeated users. These forms are retained at the reception portion of the simulated golf environment. At each visit, the player identifies the course to be played and the mode of play required.

2. At Reception 16, the player's information is transferred to the main control computer 18 of the simulated golf environment and keyed to particular player identification means which is issued to the player through the use of appropriate storage means.

3. The players carry the identification means through each of the holes played in the environment and the identification means is used to identify the players to the successive simulator devices 10.

4. The player identification means, through communication with the central computer 18, tracks the player through the successive holes and loads the player's preferred hole into the simulator for play. It will preferably also maintain and display upon request, the particulars of the hole and score for the player similar to a scorecard.

   a. When a hole station is vacant, the player approaches the station and the identification means is used to identify the player by swiping their card through the RTU 19 reader.

   b. The identification means reader will transmit the player identification information to the central control computer 18.
c. The central control computer 18 will then query the player information from the control database.

d. When the control database record is located, the central control computer 18 will then load the hole information corresponding with the player identification information onto the vacant simulator device 10 corresponding with the recorded player identification means.

e. When the hole is completed, the station simulator device 10 will then update the control computer on the completion of the hole and the player then moves to the next station.

f. An advertising display will be loaded based on the player identification means when the hole is completed.

The identification means is used at the RTUs/simulator devices 10 to activate the required RTU/simulator device for play. Each RTU/simulator device of the illustrated embodiment is provided with a reading device, capable of accessing information which may be stored on the identification means.

In the present specification and claims, the word "comprising" and its derivatives including "comprises" and "comprise" include each of the stated integers but does not exclude the inclusion of one or more further integers.

Reference throughout this specification to "one embodiment" or "an embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, the appearance of the phrases "in one embodiment" or "in an embodiment" in various places throughout this specification are not necessarily all referring to the same embodiment. Furthermore, the particular features, structures, or characteristics may be combined in any suitable manner in one or more combinations.
Claims:
1. A simulated golf environment including a plurality of golf game simulator devices wherein at least one player uses a number of the simulator devices to play successive holes of a simulated golf course.
2. A simulated golf environment according to claim 1 including a first area with a number of simulator devices, and a second area including amenities including food and beverage services.
3. A simulated golf environment according to claim 1 including an area containing one or more practice teaching or analysis simulator devices.
4. A simulated golf environment according to claim 1 including a multiple of nine simulator devices.
5. A simulated golf environment according to claim 1 provided in two main portions, namely a hardware portion including the simulator devices, physical features and surroundings of a golfing environment and a software component which will include the manner in which the simulated experience is managed on the simulator devices and their functional aspects.
6. A simulated golf environment according to claim 1 wherein each of the plurality of simulator devices is linked to and managed by, a central control system.
7. A simulated golf environment according to claim 6 wherein the environment is managed using a distributed control pattern managed from the central control system.
8. A simulated golf environment according to claim 1 wherein each simulator device includes a tee area, a ball flight path analyzer capable of simulating balls in flight as well as along the ground, a computer processor, projection means and a projection screen.
9. A simulated golf environment according to claim 8 wherein the tee area of each simulator device is provided with multiple surfaces, one of "fairway" length grass, one of longer grass length to simulate "rough" and a third of sand to simulate a bunker.
10. A simulated golf environment according to claim 8 wherein the tee areas for each simulator device are linked by a path to facilitate and define movement between successive simulator devices.
11. A simulated golf environment according to claim 6 wherein the central control system is a distributed control system (DCS) which does not require operator intervention for normal operation of the simulator devices but the DCS including an associated supervisory control and data acquisition (SCADA) system which permits operator interaction with, and control of, the simulator devices via the SCADA system.

12. A simulated golf environment according to claim 5 wherein the three main components of the hardware control system of the present invention are:
   a. a plurality of remote terminal units (RTU’s) each of which is in turn associated with a simulator device;
   b. a central control system (CCS) with Human Machine Interface (HMI); and
   c. communication infrastructure between each of the RTU’s and the CCS.

13. A simulated golf environment according to claim 11 wherein a further reception area is provided with means to permit operator interaction with the simulator devices.

14. A simulated golf environment according to claim 12 wherein the central control system with control HMI is associated with a Reception area in the environment.

15. A simulated golf environment according to claim 14 wherein players are issued with identification means used at the simulator devices to activate the required simulator device for play.

16. A simulated golf environment according to claim 16 wherein each simulator device is provided with a reading device capable of accessing information which is stored on the identification means.

17. A simulated golf environment according to claim 5 wherein the software allows play in practice mode as well as a playing mode.

18. A simulated golf environment according to claim 6 wherein the central control system includes a clock to track progress of users and where a period of time allocated for a user to play a simulated hole has passed, a warning message is generated and displayed at the simulator device.

19. A simulated golf environment according to claim 1 wherein the central control system displays advertising media on the simulator device through the
projection means when no player is active on a simulator device.

20. A simulated golf environment according to claim 6 wherein each simulator device has an alert function to alert the central control system and/or operator that assistance is required.

5 21. A simulated golf environment according to claim 6 wherein a centralized updateable leaderboard is provided and linked to the central control system to allow the scores of each of the players to be displayed thereon.
Figure 2
INTERNATIONAL SEARCH REPORT

PCT/AU2007/000236

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.

/1635 69/56 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

DWPI: IPC A63B 67/02, 69/36, 69/00, A63F H-, 13/- and keywords' golf, simulate, interact, environment, hole, green, confine, miniature, network, internet, link, cafe, kiosk, plural, successive, and similar terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>WO 1999/008757 A1 (CALAMIA et al.) 25 February 1999 See entire document</td>
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Date of the actual completion of the international search

07 May 2007

Date of mailing of the international search report

10 MAY 2007

Name and mailing address of the ISA/AU

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