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Menicou(10) **Pub. No.: US 2010/0022289 A1**(43) **Pub. Date: Jan. 28, 2010**(54) **DETERMINATION OF GAME
CHARACTERISTICS FOR A GAME OF SKILL****Publication Classification**(76) Inventor: **Kyriacos Menicou**, Hampshire
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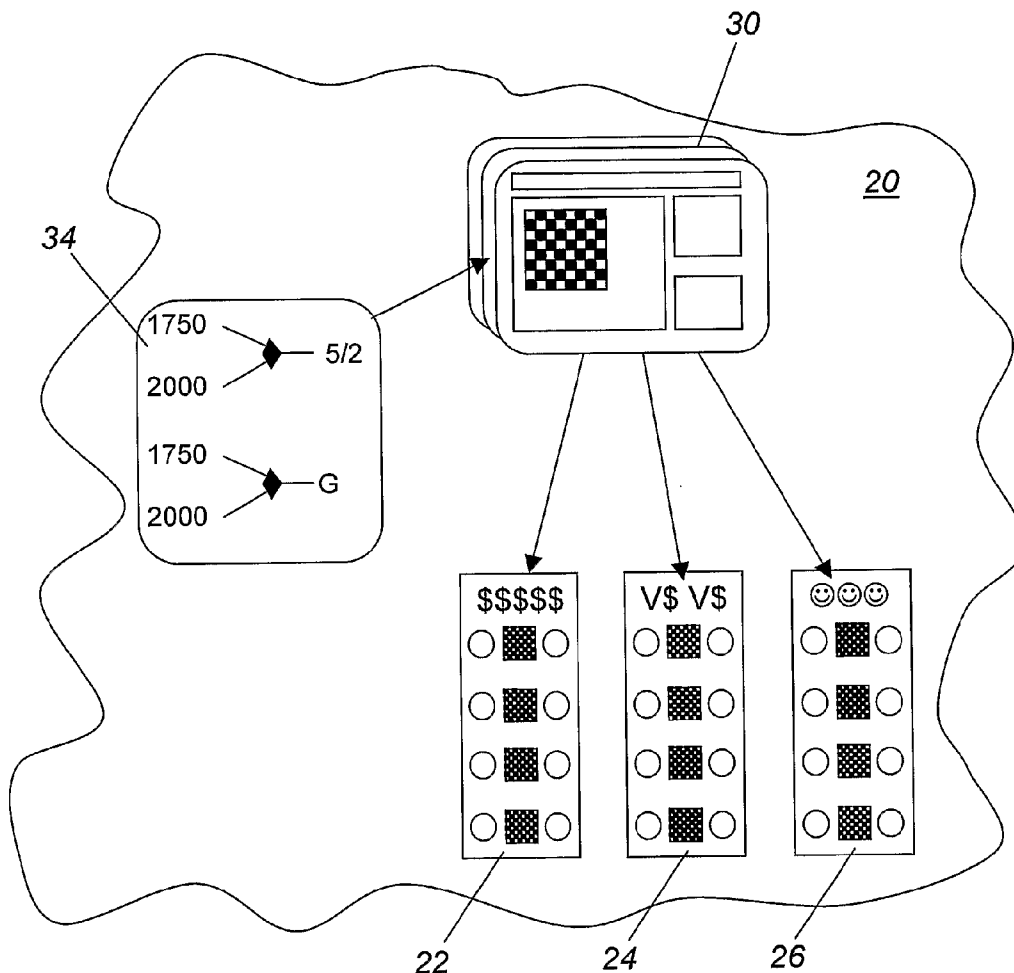
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TROY, MI 48084 (US)**(21) Appl. No.: **12/517,929**(22) PCT Filed: **Dec. 5, 2007**(86) PCT No.: **PCT/GB2007/004641**

§ 371 (c)(1),

(2), (4) Date: **Sep. 8, 2009****Related U.S. Application Data**(60) Provisional application No. 60/872,895, filed on Dec.
5, 2006.(57) **ABSTRACT**

A method and associated system for automatically determining game characteristics for a game of skill, the method comprising: (a) determining or accepting a first numerical rating associated with said first participant; (b) determining or accepting a further numerical rating associated with a further participant in said game; wherein said first and further ratings are indicative of an ability level of said first and further participants, to the extent said ability level is known; (c) calculating a likelihood of a scenario, said scenario being representative of a specific outcome to said game, said likelihood being a mathematical function of said first and further numerical ratings; (d) generating betting odds based on said calculated likelihood. One application of the invention can be found in turn-based games of skill such as chess or the like.



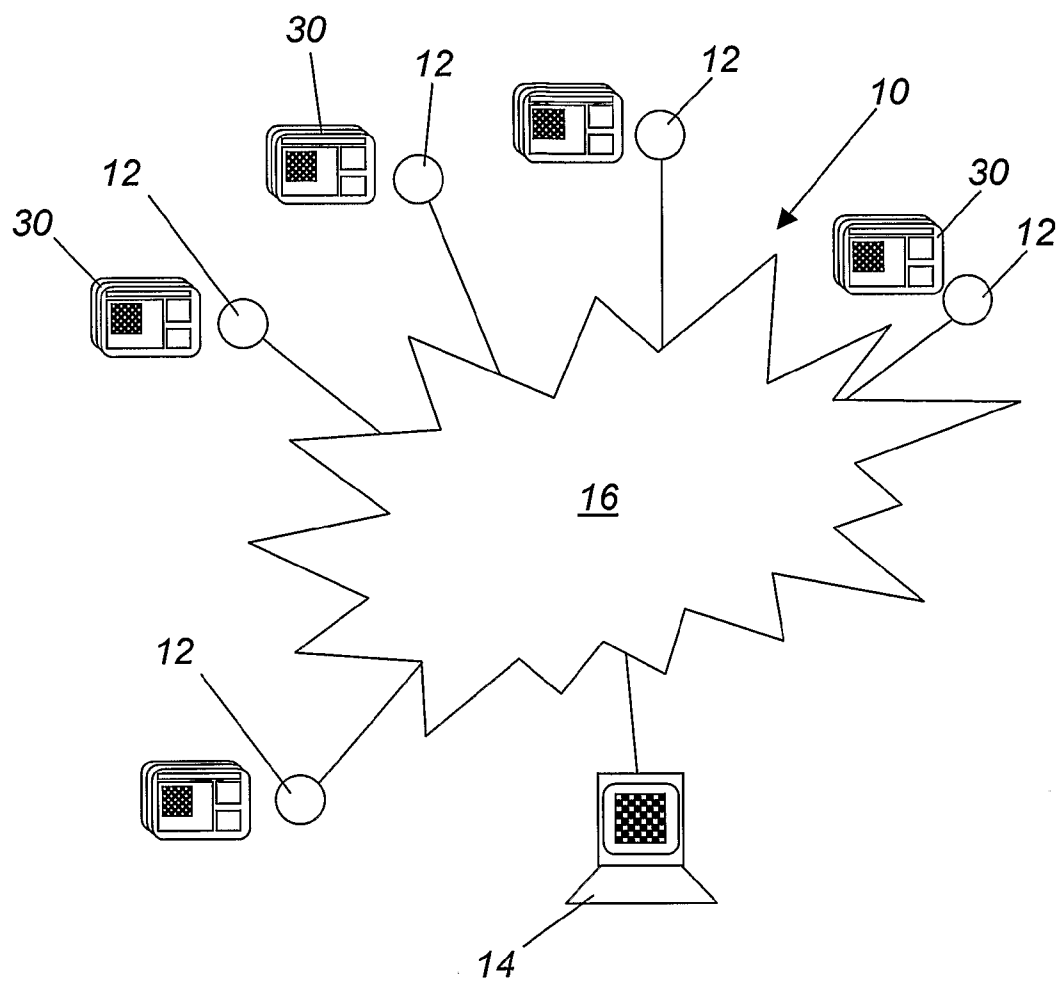


Fig. 1

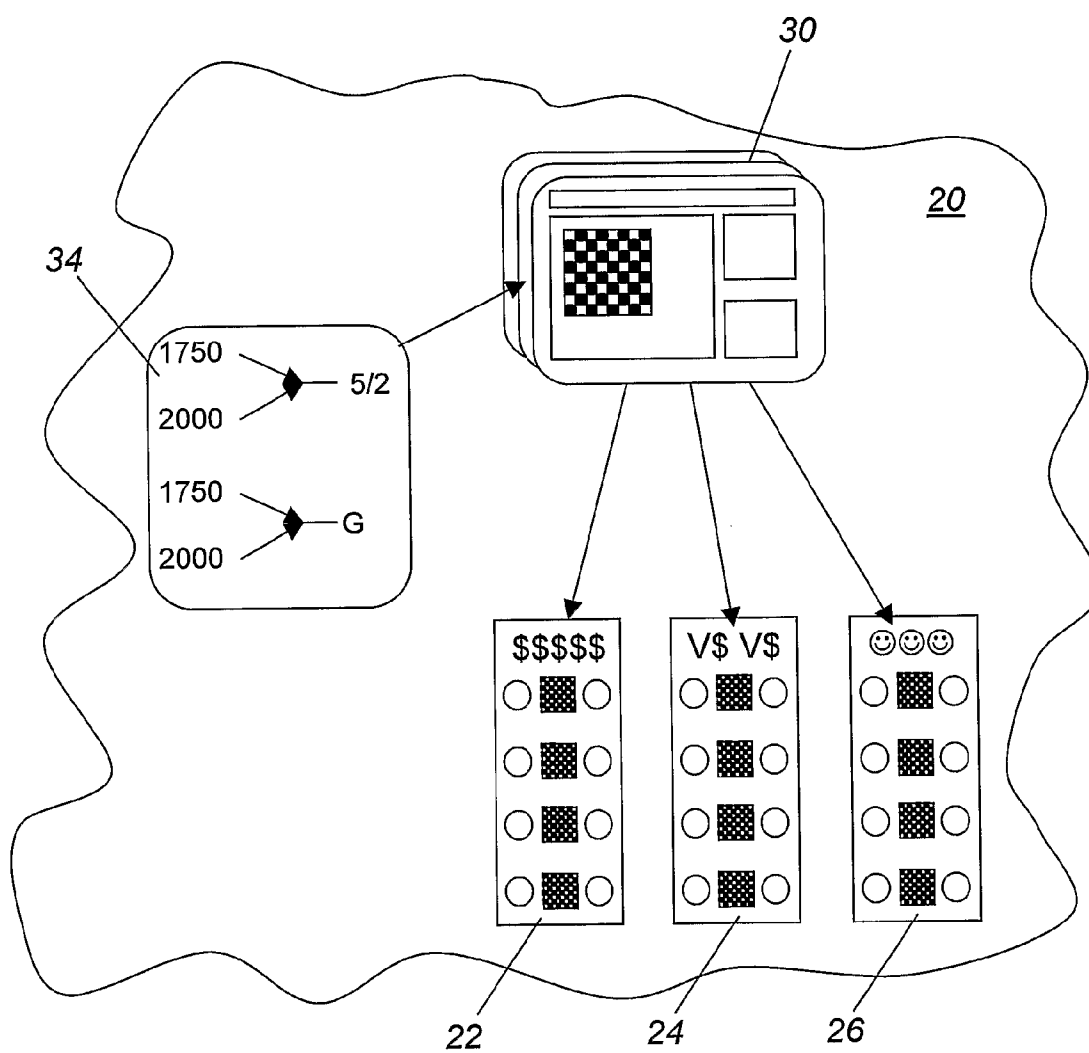


Fig. 2

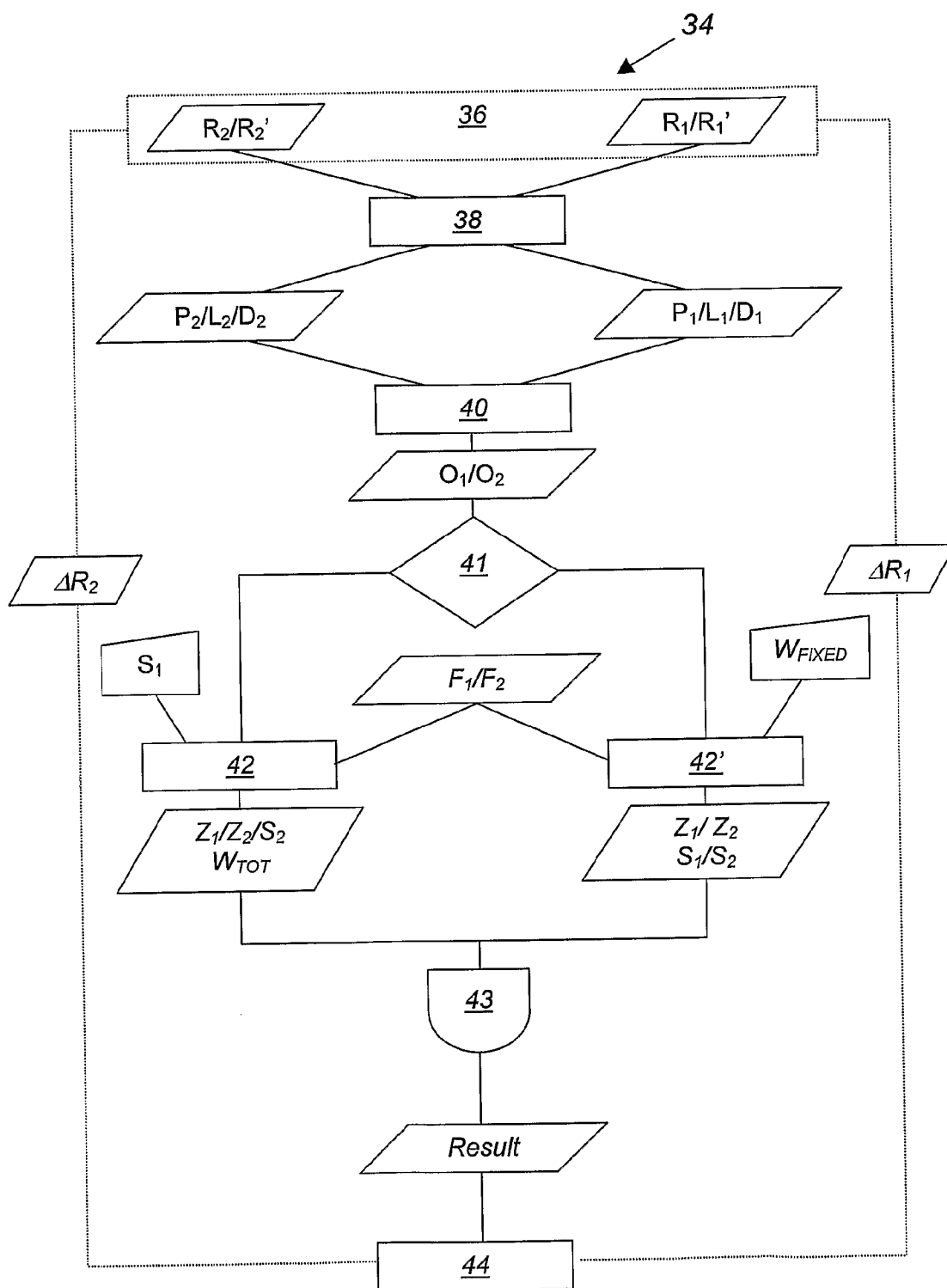


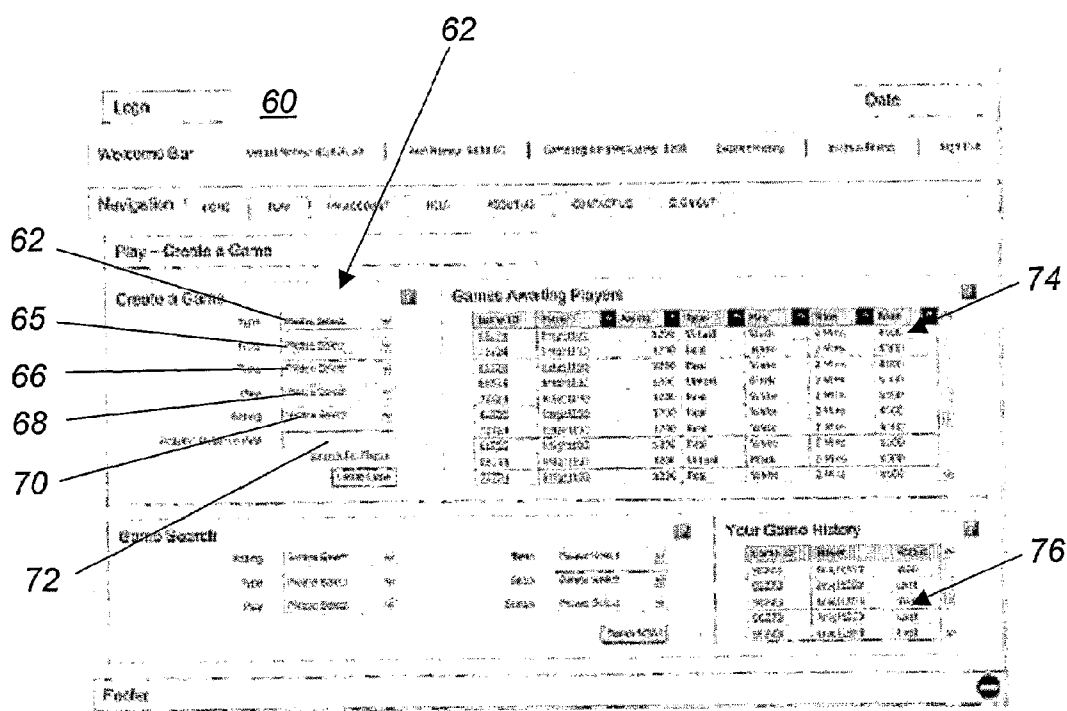
Fig. 3

Ranking																			
700/800	evs																		
801/900	2:1	evs																	
901/1000	9:4	2:1	evs																
1001/1100	5:2	9:4	2:1	evs															
1101/1200	1:4	5:2	9:4	2:1	evs														
1201/1300	3:1	1:4	5:2	9:4	2:1	evs													
1300/1400	10:3	3:1	1:4	5:2	9:4	2:1	evs												
1401/1500	7:2	10:3	3:1	1:4	5:2	9:4	2:1	evs											
1501/1600	4:1	7:2	10:3	3:1	1:4	5:2	9:4	2:1	evs										
1601/1700	9:2	4:1	7:2	10:3	3:1	1:4	5:2	9:4	2:1	evs									
1701/1800	5:1	9:2	4:1	7:2	10:3	3:1	1:4	5:2	9:4	2:1	evs								
1801/1900	11:2	5:1	9:2	4:1	7:2	10:3	3:1	1:4	5:2	9:4	2:1	evs							
1901/2000	6:1	11:2	5:1	9:2	4:1	7:2	10:3	3:1	1:4	5:2	9:4	2:1	evs						
2001/2100	13:2	6:1	11:2	5:1	9:2	4:1	7:2	10:3	3:1	1:4	5:2	9:4	2:1	evs					
2101/2200	7:1	13:2	6:1	11:2	5:1	9:2	4:1	7:2	10:3	3:1	1:4	5:2	9:4	2:1	evs				
2201/2300	15:2	7:1	13:2	6:1	11:2	5:1	9:2	4:1	7:2	10:3	3:1	1:4	5:2	9:4	2:1	evs			
2301/2400	8:1	15:2	7:1	13:2	6:1	11:2	5:1	9:2	4:1	7:2	10:3	3:1	1:4	5:2	9:4	2:1	evs		
2401/2500	9:1	8:1	15:2	7:1	13:2	6:1	11:2	5:1	9:2	4:1	7:2	10:3	3:1	1:4	5:2	9:4	2:1	evs	
2500+	10:1	9:1	8:1	15:2	7:1	13:2	6:1	11:2	5:1	9:2	4:1	7:2	10:3	3:1	1:4	5:2	9:4	2:1	evs

Fig. 4

Game	White Rating	Black Rating	Rating Level	Difference Level	Required Moves	Required Points	Actual Moves	Actual Points	Result	Lower Result	Moves Adjust	Points Adjust	White Rating Adjust	Black Rating Adjust
1	1720	1460	1300	200	25	15	22	14	1	0	-0.25	-0.25	4	-4
2	1456	1724	1300	200	25	15	25	8	1	1	0.5	0	16	-16
3	1707	1473	1300	200	25	15	25	10	0	1	0.5	0	-16	16
4	1489	1691	1300	200	26	15	25	11	1	1	0	0	15	-15
5	1676	1504	1500	0	25	15	21	17	0	1	0	0.5	-15	15
6	1519	1661	1500	0	25	16	26	17	1	1	0.5	0.5	14	-14
7	1648	1532	1500	0	26	16	26	12	0	1	0.5	0	-13	13
8	1546	1634	1500	0	26	16	27	18	1	1	0.5	0.5	13	-13
9	1622	1558	1500	0	27	17	27	17	0	1	0.5	0.5	-12	12
10	1570	1610	1500	0	27	17	27	16	0	0	0.5	-0.25	-9	9

Fig. 5



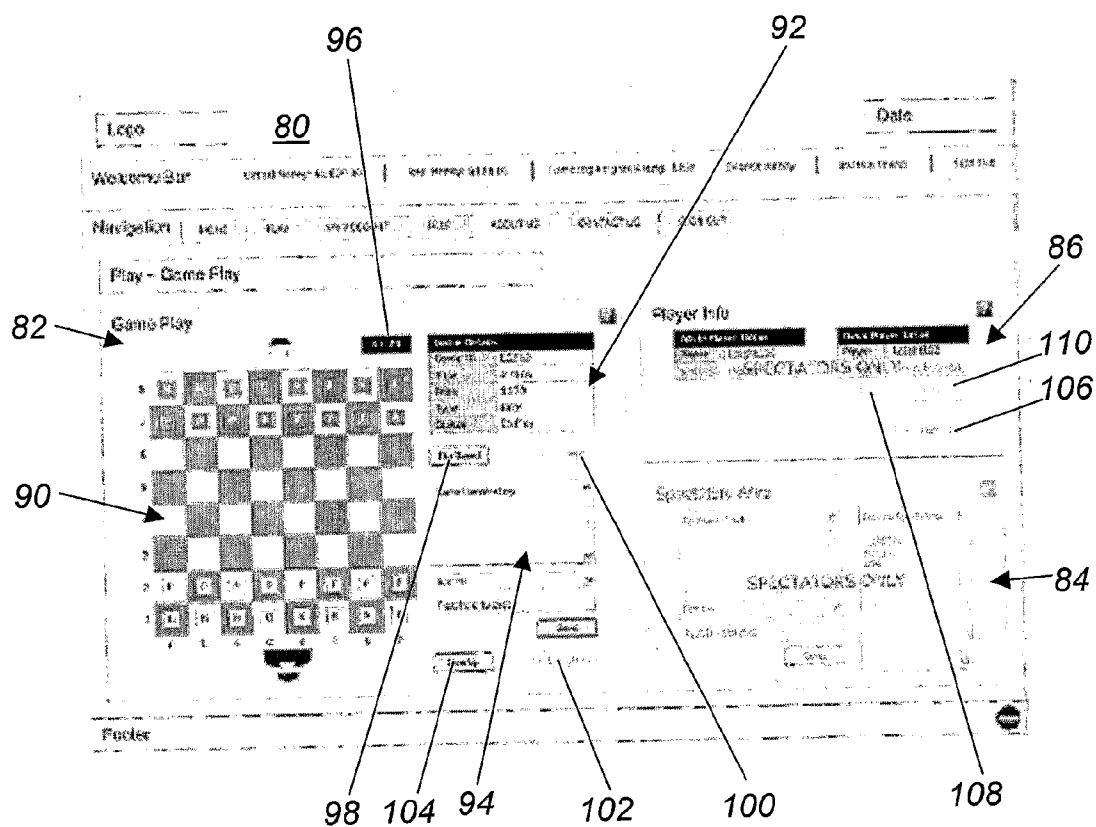


Fig. 7

DETERMINATION OF GAME CHARACTERISTICS FOR A GAME OF SKILL

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority from U.S. Provisional Application Ser. No. 60/872,895, filed on Dec. 5, 2006, and from International Patent Application No. PCT/GB2007/004641, filed on Dec. 5, 2007, both of which are incorporated herein in their entirety by reference.

FIELD OF THE INVENTION

[0002] The present invention relates to a method and apparatus for automatically determining game characteristics for a game of skill, such as, for example, game rules or odds for a wager placed by a first participant in the game.

BACKGROUND

[0003] Gambling between participants in online games played across communication networks such as mobile phone networks and the Internet is well known. Currently most online gambling of this type is associated with games of chance, for example card games including variations on Poker, Blackjack or the like.

[0004] Whilst it will be appreciated that playing such games of chance successfully may involve very high skill levels, the skill of playing lies primarily in a player's ability to make decisions on game play, and to determine an appropriate betting strategy, based on an understanding both of the likelihood of certain outcomes, and of the likely way that other players will behave in response to those decisions and betting strategy. Ultimately, however, the cards a player is dealt in a card game is determined by chance.

[0005] Such games are well suited to online gambling precisely because of the element of chance involved. The chance factor acts to level the playing field between players having different levels of experience, making it more attractive for novices to start playing. Furthermore, in games such as poker, the potential return to a participant is based on the total waged by other players during the course of a game. Thus, the potential return can be very high and as such acts as a major incentive to new participants to take part. Nevertheless, despite the potentially high returns, there is very little financial risk to the games provider.

[0006] The playing of games of skill such as chess, across communication networks is also well known. However, organized wagering between the participants in games of skill of this type and especially two player games, such as chess, is currently seen to be unfeasible.

[0007] Firstly, the outcome of a game of skill depends primarily on the relative ability of the participating players rather than on chance factors. However, the players participating in games across communication networks are generally of unknown ability. Hence, it is very difficult for a games provider to accurately and reliably determine the relative skill of different players. Whilst some games of skill, such as chess, have a recognised rating system for providing an indication of the ability of players, it is not possible for the games provider to accurately assess the reliability of ratings claimed by participants.

[0008] Furthermore, there is little incentive for players to risk a wager when there is uncertainty relating to the relative ability of an opponent. For example, a less experienced player

may be reluctant to play or else to risk a wager against a more experienced player because the risk of losing is too high in relation to the potential winnings. This reluctance can be mitigated by more favourable odds being offered to the less experienced player as an incentive to participate. Additionally or else alternatively, the players may informally elect to start the game from a position which favours the weaker player such they are given a head start. However, the difficulty in accurately assessing the relative ability of an unknown player, and the reliability of any claimed rating, makes it difficult for participants to judge fair odds or suitable starting conditions.

BRIEF SUMMARY

[0009] It is an object of the present invention to provide a method for automatically determining game characteristics in a game of skill, for example chess, which mitigates at least some of the above issues.

[0010] It is a further object of the invention to provide an improved method for leveling the playing field between players of different abilities in games of skill.

[0011] According to one aspect of the present invention there is provided a method for automatically determining game characteristics for a game of skill, the method comprising: (a) determining or accepting a first numerical rating associated with said first participant; (b) determining or accepting a further numerical rating associated with a further participant in said game; wherein said first and further ratings are indicative of an ability level of said first and further participants, to the extent said ability level is known; (c) calculating a likelihood of a scenario, said scenario being representative of a specific outcome to said game, said likelihood being a mathematical function of said first and further numerical ratings; (d) generating betting odds based on said calculated likelihood.

[0012] The present invention is particularly suited to turn-based games of skill, including mental games such as chess, draughts, backgammon, Othello or the like. However the present invention may be applied to other games of skill.

[0013] According to a second aspect of the present invention there is provided a method for automatically determining game characteristics in a game of skill, the method comprising: (a) determining or accepting a first numerical rating associated with said first participant; (b) determining or accepting a further numerical rating associated with a further participant in said game; wherein said first and further ratings are indicative of an ability level of said first and further participants, to the extent said ability level is known; (c) calculating odds for a scenario, said scenario being representative of a specific outcome to said game, said odds being generated based on first and further numerical ratings.

[0014] The game characteristics in either said first or second aspects may comprise odds for a wager placed by a first participant in said game of skill.

[0015] According to a third aspect of the present invention there is provided a method of equalizing a two player game of skill between players of different abilities comprising: for each player determining or accepting an associated numerical rating, wherein said each numerical rating is indicative of an ability level of said associated player calculating a likelihood of at least one of said players winning said game; generating a goal for an associated one of said players based on each said calculated likelihood, wherein on achievement of said goal said associated player is designated winner of said game; said

goal being such that each participant has an approximately equal chance of winning the game.

[0016] According to further aspects of the present invention there are provided a system and a data carrier for implementation of the methods of any or any combination of the first, second and/or third aspects of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Various embodiments of the invention will now be described in further detail by way of example only with reference to the attached figures in which:

[0018] FIG. 1 shows a chess network;

[0019] FIG. 2 shows a chess environment for provision over the chess network of FIG. 1;

[0020] FIG. 3 shows a flow chart illustrating operation of an odds calculator forming part of the chess environment of FIG. 2;

[0021] FIG. 4 shows a table for generating odds;

[0022] FIG. 5 shows a table of a worked example of a method for amending game parameters in accordance with player performance;

[0023] FIG. 6 shows a game set-up area of a user interface forming part of the chess environment of FIG. 2; and

[0024] FIG. 7 shows a game play area of a user interface forming part of the chess environment of FIG. 2.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0025] An embodiment of the invention will now be described by way of example only, with reference to the game of chess. It will be appreciated by those skilled in the art that many features of the invention are just as well suited to other games of skill and in particular to other games of skill involving two players.

Chess Network

[0026] In FIG. 1, a chess network is illustrated generally at 10. The network comprises a communications network having a plurality of player nodes 12, and at least one provider node 14, interconnected via a communications medium 16.

[0027] The chess network 10 can be implemented using any suitable communications architecture. The chess network 10 may, for example, be implemented over the Internet. In an Internet based chess network each player node 12 comprises an interface device capable of accessing the Internet, such as a desktop or laptop personal computer, a personal digital assistant, or a mobile/cell phone or the like. Each provider node 14 will typically comprise a server computer or the like, and the communications medium 16 will comprise either an intranet or the Internet itself.

[0028] Alternatively or additionally the chess network 10 may be implemented using a mobile communication, cell phone, network or the like, in which each player node 12 is a mobile communications device compatible with the network.

[0029] According to a further embodiment, each player node 12 may communicate over a local wired or wireless network. In any of the above embodiments, the provider node may also be a player node such that any player node 12 can host a network game for a plurality of players. It will also be appreciated to the person skilled in the art that a plurality of nodes may not be required and the present invention could in one embodiment be implemented using a single player node 12 having player data stored for a plurality of players. In such

an embodiment, a user interface and/or controls may be provided for each player or else each player could share, or take turns in using a single user interface or set of user controls.

[0030] The invention may be implemented on suitable hardware using a data carrier comprising the relevant machine-readable instructions, such as a data signal or a data storage device such as a CD, DVD, a memory stick, a hard disk or any other suitable media.

[0031] The following description applies to Internet based online chess games in particular. It will be appreciated, however, that the technology could easily be adapted to other communications networks or else for devices which are not continually connected to a network. Any device comprising processing means such as for example a CPU, storage means and a display means may be sufficient for carrying out the present invention.

[0032] The provider node 14 is configured to provide a chess environment over the Internet 16 to allow a participant at a particular player node 12 to participate in an online game of chess with another participant at any other player node 12, in real time. The implementation of real time chess games across the Internet is well known and will not be described again in detail.

[0033] A commercial provider operates the provider node 14, and participants in online games are either members of the chess network, computer competitors, or invited guests. Invited guests may include well-known players such as grandmasters, celebrities or the like. It will be appreciated that grandmasters may also be members of the chess network in their own right.

[0034] In FIG. 2 a block diagram illustrating a chess environment is shown generally at 20. The chess environment 20 is split into three main areas: a play for real money area 22; a play for virtual money area 24; and a play for free area 26. Any of areas 22, 24 or 26 may be provided as a stand-alone network game environment

[0035] The play for money area 22 is configured to provide access to aspects of chess that can be played for money, including the provision for ad-hoc and pre-arranged games between participants, organized games between members and invited guests, and games between members/invited guests and computer competitors. In the real money area 22 provision is made for members to make wagers on their own performance in a game against another member, against an invited guest, or against a computer competitor. Provision is also made for members to spread bet on various scenarios in games involving a participant of a particularly high skill level, for example, a grandmaster. Spread betting may cover any appropriate scenario, for example, betting on what opening gambit used, the first piece captured, the pieces remaining on the board at the end of the game, or the like.

[0036] It will be appreciated that although the a principal aim of the invention is to allow members to place a wager at appropriate odds on a game they participate in, the invention also facilitates the placing of wagers by non-participant members on games. Wagers by non-participant members may be restricted for example by legislation, or to limit the exposure of a provider to financial loss as a result of fraud. Wagers could, for example, be limited to games between participants of similar ratings, thereby preventing participants betting on artificially generated long odds.

[0037] The winnings for a wager placed by a participant in a game is paid out of the opponents stake, thereby eliminating financial risk to the provider for such bets.

[0038] Members are also provided with means to challenge a grandmaster to play against a computer competitor and on acceptance of the challenge, to bet on the result, or to spread bet on various scenarios.

[0039] The virtual money area **24** is provided to allow a member to set-up and play an ad-hoc or a pre-arranged game against another member for virtual money. The virtual money area is provided to allow participants to hone, not only their chess playing skills, but also their skills at assessing the appropriate level and nature of wagers to play, and also the risk level involved in making such wagers against participants of differing experience and ability.

[0040] The virtual money area does allow members to spread bet on grandmaster games, but all other aspects of real money play are not made available in the virtual money area.

[0041] The free play area **26** allows members to set-up and play ad-hoc and pre-arranged games of chess purely for fun and enjoyment, without any financial implications.

[0042] The chess environment **20** includes a plurality of versions of chess including all the most common variations, for example Blitz with time controls ranging from one minute upwards. The environment **20** is also configured to allow competition chess, for example chess tournaments and/or leagues, in addition one of games between members.

[0043] Members of the chess network **10** are allowed to set-up games in which at least one participant is a computer competitor. Such games are allowed as long as the nature of the computer competitor is fully disclosed. Computer competitors will, however, be prohibited from playing against human participants in game variations having strict time controls, such as Blitz or the like.

[0044] Access to the chess environment **20** is provided by a graphical user interface **30** implemented using any suitable graphical tool compatible with the player nodes **12**. Typically, for example, the user interface **30** comprises a website including a plurality of web pages for accessing various features of the chess environment **20**.

Membership

[0045] Membership of the chess network is strictly controlled. All prospective members wishing to join the chess network **10** are required to go through an online application or verification procedure.

[0046] On application to join the chess network, prospective members are required to supply a verifiable e-mail address and to choose a username and password. The user name and password form the basis of a new membership account. Prospective members may also be required to provide appropriate personal information, for example a terrestrial mail address, contact telephone number etc.

[0047] Prospective members are then requested to enter a current numerical chess rating based on an internationally recognised system, and verified either from another Internet chess site such as the Internet Chess Club (ICC) or the like, or from a recognised body such as the United States Chess Federation (USCF), or the Federation Internationale des Echecs (FIDE) also known as the World Chess Federation. An example of an appropriate rating system is the 'Elo' rating system created by Arpad Elo, which is a recognised method for calculating the relative skill levels of players in two-player games of skill such as chess.

[0048] Where the prospective member's chess rating cannot be verified the claimed rating is provisionally accepted for subsequent verification during the prospective member's ini-

tial games, subject to a minimum rating. Where a prospective member cannot provide a chess rating based on a recognised system, a suitable provisional rating is assigned, indicative of an 'average' low entry participant. Typically, for example, a rating of 1200 would be appropriate for such a participant. By comparison, under the USCF's rating system, the average rating for a club player was originally targeted at 1700. It will be appreciated, however, that any suitable rating may be selected and that a provisional rating may be assigned based on replies to a series of appropriate questions, for example, "How often do you play chess?", "Do you play in a club?", etc.

[0049] The chess environment **10** is provided with an internal rating system based on the Elo methodology. However, whilst most organizations use an Elo based system, each uses a different variation thereby resulting in differences in the rating attributed to a player having the same results. Any rating entered is therefore normalized against the internal system of the chess environment **10** and an appropriate internal rating generated.

[0050] Any prospective member wishing to use the real money area is also required to supply debit or credit card details with an address that corresponds to the credit card billing address, to provide verification of age.

[0051] On completion of the application, the prospective member is required to acknowledge reading and understanding the sites terms and conditions before being registered as a member.

Ratings

[0052] An unverified provisional rating claimed by a new member, or the rating assigned to the new member, is validated over a pre-determined number of games, typically twenty, although ten would be adequate to establish an accurate rating. During rating validation, the activities of the new member within the real money area are restricted. For example, the maximum wager made by the new member may be limited for games in which the new member takes part. Such a maximum wager may be set at for example to \$30.00 or else may be zero for one or more games and may vary with games completed using the environment

[0053] The new member may also play virtual money games and/or money free games to establish a validated rating. A verifiable rating from another Internet site or recognised body is still validated but over a smaller pre-determined number of games, typically ten, although as few as six may be adequate to establish an accurate rating.

[0054] Validation is achieved by comparing the performance level expected if the current rating is accurate, with the actual performance over a series of games. Where performance falls short of the expected rating the rating is lowered accordingly, where performance is better than expected the rating is increased.

[0055] A simple equation for the modification of ratings is: $R' = R + K(A - B)$ where R' is the modified rating, R is the current rating, A is the actual score in a game or over a number of games (1=Win, 0.5=Draw, and 0=Loss), and B is a virtual score predicted by the relative ratings of the participants in the game. K is a constant, which sets the maximum adjustment for any individual game. Typically, for example, K will be 16 for grandmasters and 34 for weaker participants. Other adjustment mechanisms are also possible.

[0056] A player's predicted 'score' for a particular game is given by: where $R-i$ is the rating of participant for whom the

score calculated, and R2 is the rating of their opponent. It will be appreciated that ratings adjustment and predicted scores can be calculated separately for each participant using the above equations.

Odds Calculator

[0057] The chess environment 20 is further provided with an odds calculator 34, for automatically determining a return for wagers placed by participants. In operation participants making use of the odds calculator 34 are provided with proposed odds for a particular game based on their relative current ratings, which competitors in a particular game may either accept or adjust by mutual agreement.

[0058] A game may be set up either with a fixed prize fund, or a fixed stake. In fixed prize fund games, the size of the prize fund is decided by mutual agreement of the participants. Each participant is then required to contribute to the prize fund, in dependence on the odds provided by the odds calculator. Thus, a participant having a particular rating contributes less to the prize fund than a higher rated opponent and vice versa. By agreeing the prize fund the loss to each participant is limited.

[0059] In a fixed stake game, a member wishing to play a game for money sets up a game via the user interface, places a stake in the prize fund, and elects to use odds calculated by the odds calculator. When another member wishes to participate in the game, odds are calculated for the game in dependence on the relative ratings of the participants. The member wishing to join the game is then required to place a stake in the prize fund in dependence on the calculated odds. Hence, the size of the prize fund will vary in dependence on the rating of the member joining the game. The member initiating the game may limit the risk of loss by setting appropriate qualification requirements for entry to the game, for example limiting entry to members having a maximum rating of 200 above that of the initiating member.

[0060] As seen in FIG. 3, for any particular game the odds calculator 34 is configured to:

[0061] (a) Determine the numerical rating for each participant at 36;

[0062] (b) Calculate a likelihood of a win, a draw, or a loss at 38;

[0063] (c) Generate fixed odds for wagers between participants in games at 40;

[0064] (d) Determine a return for a stake value proposed by a participant at 42 or 42'; and

[0065] (e) Generate an adjustment to the actual rating of each participant at 44 dependent on the result of the game.

[0066] At 36, the numerical rating determined for each participant comprises either the current actual rating recorded for the participant in the chess environment 20, or a virtual rating. A virtual rating is generated by the odds 34 calculator, based on the actual rating of the corresponding participant and any handicap or other parameter adjustment made to bias a particular game against or in favor of the participant.

[0067] At 38 the odds calculator 34 calculates a likelihood of a particular participant winning based on the following equation:

[0068] where R1 is the rating determined for the first participant, R2 is the rating determined for the second participant, and P1 is the calculated likelihood of the first participant winning, taking account of the possibility of a draw. The

equation for determining the likelihood of winning may also be represented as:

$$P1 = B - <1 > A(B - B <2 >)$$

[0069] where B is the player's expected score as defined above.

[0070] The likelihood of the first participant losing is given by:

[0071] The likelihood of the player losing is also calculable as the likelihood of the opposing player winning using the above formulae, where B has been calculated for the opposing player.

[0072] The likelihood of a draw is given by: or else by:

$$D1 = B - B <2 >$$

[0073] At 40, the odds calculator automatically determines an appropriate set of odds based on a comparison of the likelihood P1 of the first participant winning, with the corresponding likelihood P2 of the second participant winning. Thus, it is the relative ratings that are used to determine appropriate odds, rather than absolute ratings. Alternatively or additionally the odds may be determined automatically, based on a direct comparison of the ratings determined at 36.

[0074] One method of converting the likelihood into odds is by way of a tabular system, in which a two-dimensional array of odds is generated for given probabilities or ratings. One example of such a table is shown in FIG. 4. The rankings are banded into discrete ranges between a minimum and maximum value such that the array is defined by a series of rows and columns. The columns represent the bandings for a first player and the rows represent the bandings for the second player.

[0075] In FIG. 4, it can be seen that the rating values between 700 and 2,500 or more have been arranged in bands of 100, resulting in a table of 19 rows and 19 columns. Greater or lesser bandings may be used as appropriate.

[0076] The table of FIG. 4 is populated with odds values but it will be appreciated that the table may instead be populated with conversion factors in order to allow the odds to be calculated. A given banding for player one will specify a particular column and a given banding for player two will specify a particular row, resulting in a single odds value for the match.

[0077] The diagonal line of cells marked 'evs' indicates evenly matched ranking between players, whilst the remaining cells indicate odds in favor of one of the two players. It will be appreciated that the upper half of the table of FIG. 4 has not been populated since the values in this half of the table will mirror the values shown in the lower half.

[0078] By way of example, a game between participants having a rating difference of 200 generates odds in favor of the weaker participant of around 9/4, whereas a rating difference of 1000 may result in odds of 5/1 or higher depending on the method used.

[0079] The precise odds generated will depend on: the maximum odds allowed for a member to member game; and a maximum rating differential between participants above which the odds are capped. For example, if the odds are limited to a maximum of 10/1, and the maximum rating difference is 1500, the odds generated for a 1500 differential or greater will be 10/1, whilst the odds generated for differentials between 0 and 1500 will be spread over the range evens to 10/1.

[0080] A tabular system as shown in FIG. 4 provides a beneficial way of calculating odds since the required variance

in odds over the required spread of ratings can be represented as a line on a chart as required and the table can be populated with values taken from the line. Thus the shape of the line can simply be modified and the table values adjusted to take account for specific rules or criteria. In the example of capped maximum odds, the line may tend towards an asymptote or else the odds may be represented as a straight line which is simply cut off at the predetermined maximum odds.

[0081] In addition the size of the bands can be increased or decreased as required to improve the accuracy of the odds calculation.

[0082] In an alternative to a tabular system, the odds can be calculated using formulae. In a simplified embodiment, this can be achieved by calculating a ratio of the probabilities of winning. If the resulting odds are greater than a predetermined maximum value then the maximum allowed odds is presented to the players in place of the actual calculated odds. An alternative function, such as an inverse exponential or logarithmic function, may be used so that the odds tend towards the required maximum value in an asymptotic manner.

[0083] Turning back to FIG. 3, at 41 a decision is made on whether parameters relating to a wager between the participants are to be calculated based on a fixed stake at 42, or a fixed prize fund at 42'.

[0084] At 42, the calculated odds and a fixed stake value S_i proposed by a first participant, are used by the odds calculator to calculate a return Z_1 , Z_2 due each participant in the event of a win, a total prize fund value $WVOT$, and a stake value due from the second participant S_2 .

[0085] The return Z_1 due to the first participant is generated, taking account of any fee F_1 imposed on the first participant by the provider, as follows:

$$Z_1 = Q - (S_1 - F_1) / H S_1 - F_1$$

where the calculated odds against the participant winning are Q/O_2 .

[0086] It will be appreciated that the fee F_1 may comprise a percentage of the stake value S_1 . The fee F_1 may, for example, be 10% of the stake value. Alternatively it may be fixed.

[0087] Thus, the opponent is required to place a corresponding stake value S_2 in the prize fund which is sufficient to cover the calculated return and any fee F_2 imposed on the opponent.

[0088] To cover the return due to the first participant, the stake value S_2 required from the opponent, to fulfill the calculated odds, is therefore given by:

$$S_2 = \hat{r} - (S_1 - F_1) + F_2$$

[0089] The fee F_2 may, for example, comprise 10% of the stake value S_2 . Alternatively it may be fixed.

[0090] The return Z_2 due the opponent is thus:

$$Z_2 = Q - (S_2 - F_2) + (S_2 - F_2)$$

and the total prize fund $WVOT$ is given by:

$$WVOT = Z_1 + Z_2 = (S_1 + S_2) - (F_1 + F_2)$$

[0091] The odds calculator is further configured to generate stake values S_1 , S_2 and returns Z_1 , Z_2 , for both participants at 42', based on a fixed prize fund value $WFXED$ proposed by at least one of the participants, and the calculated odds:

$$S_1 = W_1 \hat{r} - (S_1 - F_1) + F_1$$

and;

$$S_2 = W_2 \hat{r} - (S_2 - F_2) + F_2$$

[0092] After the stakes/returns are calculated the participants are free to play the associated game during which the odds calculator awaits completion of the game at 43.

In the event of a draw the prize fund is returned to the participants in proportion to their respective contributions, unless an agreement has been made to the contrary. For example, the participants may agree that in the event of a draw or stalemate the weaker player wins the contents of the prize fund. The fees F_1 , F_2 are retained by the provider.

[0093] At 44, on completion of the game, the chess environment 20 pays any winner the contents of the prize fund and the odds calculator generates an adjustment $[\Delta R]_i$, $[\Delta R]_2$ to the actual rating of each participant in dependence on their performance in the game. A suitable method for adjusting the rating has been described above under the subtitle "Ratings".

[0094] In addition to the above described methods of implementing the present invention, an alternative working embodiment has been devised which is in many ways preferred. This alternative embodiment takes account for the actual wager or bet made on a potential game. A modified rating can be determined by adjusting the rating calculation defined above in accordance with the actual stake, S_1 . The modified rating or 'Bet Rating', BR' can be defined as follows:

$$BR' = \hat{r} + R' * (S_i / S_{norm})$$

[0095] The modified rating BR' is used in place of the rating R' in order to calculate a player's likelihood of winning (P_1) losing (L_1) or drawing (D_1) a game in accordance with the equations defined above. Given a stake of S_j the return or payout, Z , for the player at the end of the game would be dependent on the probabilities of winning or drawing as follows:

$$\hat{r} = [1 - P_1] X - S_1 + S_j$$

$Z_{draw} = + \dots - X - S_1 + S_1$ where Z_{win} is the payout for winning and Z_{draw} is the payout for drawing. The likelihoods of winning, drawing or losing and the associated returns can be calculated in a similar manner for the opponent using a suitable modified rating, BR' for that player. The likelihoods, odds and potential winnings may be reported separately to each participant. A losing player receives nothing in return for their stake.

[0096] It will be appreciated that the odds calculator need not be used as part of the chess network, but may instead be provided as a standalone calculator for calculating the odds in any chess game. The odds calculator may, for example, be used by bookmakers to derive odds in a chess tournament or the like. The standalone calculator may be implemented as a software application on a computer or as a separate electronic calculating device.

[0097] It will be further appreciated that FIG. 3 relates to just one example of how a particularly advantageous part of the odds calculator may work. In another embodiment, a player may have a number of ratings associated with different types of game. For example, a player may display a greater or lesser level of skill dependent on whether they are playing one type of game, such as timed blitz games, as opposed to another game type, such as conventional chess. In such an embodiment, the calculation would be carried out for a type of game selected by the participant or else may be calculated

for all game types such that a user can compare odds for various games at once and then select the desired game type to initiate a game.

Handicapped And 'Equalised' Games

[0098] In addition to conventional chess game variants, the chess environment **20** is also provided with variations of chess designed to level the playing field between participants having a high rating and those having a much lower rating. The variations include handicap chess and Equalized Chess™. Handicapped chess is relatively well known. It involves the artificial weighting of a game in the favor of one participant (usually the weaker participant) by imposition of a 'handicap' on the opponent before commencement of the game proper. After the handicap has been imposed the game proceeds under normal chess rules. There are various forms of handicap that may be imposed, for example the removal of selected pieces of the opponent before the game commences, allowing the weaker participant to make additional moves at the start of the game, etc. Hence, where participants have very different ratings, the stronger participant may allow the weaker participant to remove selected pieces from the board and/or to play additional introductory moves, to improve the chances of the weaker participant winning. It will be appreciated that other forms of handicap are possible.

[0099] In order to cater for handicap games, the odds calculator **34** is further configured to generate virtual ratings for participants electing to play under a handicap, for example, by removing at least piece before the start of a game. The virtual ratings may then be used to generate alternative odds based on a comparison of the virtual rating of the handicapped participant with the actual rating of their opponent.

[0100] The nature of the handicap may be decided arbitrarily between the participants in the game. The odds calculator **34**, however, is also provided with means for generating an appropriate handicap based on the relative ratings of the participants

[0101] The chess environment is also provided with a new chess variant, Equalized Chess, in which the parameters of the game are adjusted in dependence on the relative ratings of the participating players to make it easier for the weaker participant to win. Typically the parameters required for the weaker participant to win are adjusted advantageously in their favor. Accordingly, one purpose of Equalized Chess is to allow players of differing skill to play a game with a similar chance of winning.

[0102] Typically, for example, an 'equalized' game will set a goal for the weaker participant to achieve before the stronger participant achieves checkmate. If the weaker participant achieves either checkmate, or the goal, they are classed the winner. The goal may, for example, be to take a pre-determined number of pieces, to take pieces to a pre-determined value, or to leave the stronger participant with less than or equal to a predetermined number or value of pieces.

[0103] Alternatively or additionally the goal may be simply to draw the game or to achieve a stalemate.

[0104] Constraints are placed on the goal to avoid unfair biasing in favor of the weaker participant.

[0105] The constraints may include a limitation on the type of pieces that are eligible for contributing to achievement of the goal, for example the contribution of pawns to each player's tally may be included or excluded completely. Alternatively, pawns may be included but only if the differential in the number of pawns between the participants does not

exceed one, thereby ensuring that the weaker participant has to attack premium pieces as well as pawns. For example, where the equalization goal set for the weaker participant is the accrual of a certain number of points, the contribution from captured pawns will be equal to the number of pawns captured from the stronger participant.

[0106] The constraints may alternatively of additionally include provision of a final chance for the stronger player to achieve checkmate on the turn immediately following the turn in which the weaker player achieves the equalization goal. If the stronger player does achieve checkmate on their turn, they are classed as the winner. Accordingly, a goal is not deemed to have been achieved if the opposing player achieves checkmate on a move immediately following the move on which the predetermined number of chess pieces have been captured or else a preset combined value for captured pieces has been reached or exceeded

[0107] A suitable constraint may also be to limit the time available to each player to make a move in the game. Thus the stronger player may be required to make their move in a shorter time period than the weaker player. For example the stronger player may be given 1 minute per move, whilst the weaker player is given 5 minutes per move.

[0108] In one embodiment the odds calculator **34** generates the 'equalization<1>' goal automatically when an 'equalized' game is initiated, based on the relative ratings of the participants. The goal is set such that the virtual ratings of the participants are approximately equal, allowing the participants to place wagers at even odds. The equalization goal is based on the likelihood generated by the odds calculator **34**, and numerical values assigned to each piece. The numerical values may, for example, be the established standard values: Queen=9; Rook=5; Bishop=3; Knight=3; and Pawn=1.

[0109] 'Equalized' games are typically only available to pairs of participants whose ratings differ by more than 200. Whilst the above described system does allow for a simple implementation of Equalized Chess, it has been found that the differential between the two players' ratings alone may not provide sufficient information for determining a suitable 'equalized' game. This is because rules for a game of Equalized Chess which are suitable for players having skill ratings of 500 and 1000 respectively are unlikely to be suitable for players having skill ratings of 2300 and 2800 due to the increased ability of the players. In addition, any inaccuracy in the ratings and hence the odds calculated for a game could result in a significant advantage being handed to one player.

[0110] In an alternative embodiment, a system is provided that can balance and adjust to constantly ensure that in every game, players have an equal or sufficiently close to equal chance of winning. These odds may not remain static over time either, for instance as the game becomes more popular and people adapt their playing style to suit the new rules, so too the odds may vary to maintain the equilibrium. Accordingly the rules are calculated by taking account of the skill rating of one player as well as the differential between the players.

[0111] This embodiment makes use of an array or matrix of odds containing values representing the likelihood of a player being able to survive varying numbers of moves or else being able to take or retain varying numbers of pieces. These arrays are referred to as a matrix of move odds and a matrix of piece odds. Both matrices operate according to the same principles and so only an example of the move odds matrix is described in detail below. It will be appreciated that 'equal-

ized' games may rely on any or any combination of the goals or constraints described above and is not limited to the use of any one variable. For example a similar matrix system may be used to determine suitable time constraints for each player

Table 1

[0112] Table 1 shows a simple move odds matrix. The vertical axis or first column contains the rating of the lower rated player and the horizontal axis or first row contains the rating difference between the two players. Each of these criteria is split into bands, the size of which may be adjusted as necessary. In this example, a skill rating or differential which falls between the upper and lower limits of a band would be considered to fall within the band represented by the lower band value. The matrix contains details of the number of moves which an average player of that band would be expected to achieve for a given skill rating differential between players.

[0113] For example, 1425 player would be placed in the 1400 band and a rating difference of 215 would be adjudged to be in the 200 band, such that a predicted number of moves of 24 would be returned.

[0114] The use of this allows feedback of the results of the game into the odds calculation so that the next prediction can be made more accurate. In the example above, the 1425 player may have survived for 24 moves and won the game and in that instance the system should raise the required number of moves to give the higher rated player an improved chance of winning in an ensuing game.

[0115] FIG. 5 shows a worked example of how this self-balancing might work. The scenario demonstrated is that two players with a rating difference of 260 points play a series of 10 games, alternating colors. The assumption is that the initial odds are inaccurate and in favor of the lower rated player and so over the games played the odds adjust to give the stronger player a more even chance of winning. When we reach the point where the players are winning equally the odds to stabilize and not continue to adjust, it will be appreciated that the players are alternating colors and so the relevant adjustment is made to alternating white and black players in the final two columns of FIG. 5.

[0116] Thus it can be seen that when a player achieves the goal that they set for a game, an incremental change or adjustment is made to any or any combination of the player rating, the likelihood of them winning a subsequent game, the constraints placed on each player and/or the goal to be achieved in the next game. Rating calculations have been included so that it can be seen how the players move into different odds bands as their ratings change, although in this particular embodiment, the details of the rating calculations are provided as an example only and are not relevant for the odds calculations.

[0117] With a system that automatically adjusts to equilibrium, the accuracy of the starting values are less crucial to operation of the system. However initial values have been chosen in the embodiment of FIG. 5 such that initially any lower rated players need to survive for 25 moves or capture 15 points to win the game. Within FIG. 5, it can be seen that the rate at which a player's goals are adjusted are fixed between games. However the rate of change can be modified in other embodiments such that it is a variable that can change as a function of a players performance. In one such embodiment the rate of change of the game parameters or goals could be based on how many games have been played in a given band

cross-section by a particular player. This offers an indication of how quickly a player is improving.

[0118] In addition, it would be possible to adjust the odds or game parameters by relatively large increments in the beginning with a view to reaching an equilibrium point quickly and then adjust slowly as more games are played. This could be implemented simply by reference to another matrix containing the game count for each band combination so as to return a scaling factor or else a limit to the adjustment values between games

[0119] The algorithm used for choosing the move odds is the same as that used for choosing points odds and so only one is described here for conciseness. However it will be appreciated that the points odds can be determined either on the basis of pieces taken in a game or else on the basis of pieces remaining on the board at the end of the game or after a predetermined number of moves.

[0120] A two-dimensional array or matrix is maintained where for any two combinations of player ratings it is possible to look up the required number of moves that the lower rated player needs to make to win the game. The number of moves, M, required for a win is therefore a result of lookup function of the ratings of the two players, F, and is shown below. $M=F(R1, R2)$

[0121] This lookup function locates the move odds in the maintained matrix. Based on the result of the game an adjustment to the move odds is calculated. At this point a variable, Y, is introduced to control the speed of adjustment. This may be calculated at each game dependent on several constants and the number of games, N, played between players of similar ratings.

$$Y \propto \frac{1}{N}$$

$Y = \max(Y_{min}, \min(Y_{max}, \frac{1}{N}))$ stable where Y_{min} and Y_{max} are pre-selected constants representing the minimum and maximum allowed adjustments (for example, 0.1 and 2.0), and N stable is a pre-selected constant representing the number of games that need to be played before the move odds are considered stable.

[0122] Once the adjustment speed variable, Y, has been calculated, the adjustment to the number of required moves depends on which player won the game and if the game was won due to reaching the requisite number of moves. The four possible outcomes are shown below.

[0123] High rated player wins $\Rightarrow -Y$ applied

Low rated player wins $\Rightarrow$ no change
Low rated player wins on moves $\Rightarrow Y$ applied
A draw $\Rightarrow$ no change

[0124] After the game the adjustment is fed back into the system to alter the required number of moves, M1, for the next game as shown below:

$$M1 = M + A$$

[0125] This can be repeated to calculate the number of moves after another game, M2, by simply incrementing the game count, G, and using the result of the most recent game

$$M2 = M1 + A1$$

[0126] Such incremental changes to game parameters also provide a stimulus for players to continue playing against an opponent despite a defeat.

[0127] Whilst the above embodiment, refers to the use of a single matrix, it is possible to use multiple matrices in determining the relevant 'equalization' handicaps and also for

determining the adjustment to the ratings and game parameters for subsequent games. For example, a dedicated matrix or array may be used for each individual player.

Setting Up Game

[0128] The user interface **30** is provided with a game set-up area **60** configured to allow an initiating member to set-up a game for participation in by another member, as seen in FIG. **5**. In the Internet based chess network **10**, the game set-up area comprises a web page with dropdown menus, dialogue boxes, and the like arranged to provide the desired functionality.

[0129] The game set-up area **60** is provided with a game creation region **62** comprising a plurality of drop-down menus configured for the creation of a new game. The drop down menus include a game type menu **64** configured to allow the initiating member to select the game type (for example Blitz, Handicapped, 'Equalized' or the like) and whether the game is to be a real money game, a virtual money game, or a money free game.

[0130] A user has the option of selecting a timed game such as for example a 'Blitz' game such that the user can input a desired length of game or else can choose from a selection of predetermined game lengths. Timed games of this type have been found to be beneficial in reducing the opportunity for either player to cheat during the game. In addition there is the possibility of using software having algorithms designed to identify player activity indicative of cheating.

[0131] The game creation region **60** is further provided with a prize fund menu **65** for allowing the initiating member to select an appropriate real/virtual financial prize that an opponent will receive on winning a real/virtual money game. The prize fund may comprise a fixed value prize fund to which both participants contribute, either in relation to their relative ratings using the odds calculator **34**, or otherwise by mutual agreement, when an opponent decides to join the game.

[0132] Alternatively the initial prize fund may represent a wager comprising a stake that the initiating participant is prepared to pay to an opponent who wins. When an opponent joins the game they propose a stake they are willing to pay the initiating member if the initiating member wins. If accepted, the prize fund is increased by the value of the opponent's stake and the game can commence. The winner of the game wins the prize fund less any administrative fees or the like imposed by the provider.

[0133] The game creation menu also includes: a time control menu **66** for setting timing controls for time limited games such as Blitz or the like; a play menu **68** for selecting the initiating participants color; and a qualification menu **70** for setting the preferred/required rating of the opponent.

[0134] The qualification menu **70** may be used by the initiating member, to limit participation in the game to competitors meeting certain pre-requisites, such as ratings between a certain minimum and maximum. For example, participation may be limited to members having a minimum rating equal to that of the initiating member and a maximum rating of 350 greater.

[0135] In operation, a member makes appropriate selections to set a game up. Once the game is created, the initiating member awaits another member to request entry to the game as an opponent, proposing an addition to the prize fund if appropriate. If the initiating member accepts the request, the game can commence.

[0136] The game creation region **60** is further provided with a game request box **72**, to allow a member to request a game from another specific member. The member making the request is required to enter means for identifying the specific member, for example the member's username.

[0137] To assist the member making the request to find the specific member, a search link is provided to allow access to simple search field. The member making the request is then allowed to use the search field to search by appropriate identification details, for example, by partial username and/or email.

[0138] It will be appreciated that although drop-down menus are described, the functionality can alternatively or additionally be implemented using any suitable web controls, for example, data entry boxes or the like.

[0139] The game creation area **60** is also provided with a game history region **74**, which displays information relating to the past performance of the member accessing the game creation area, directly to their user interface **30**.

Selecting Existing Games

[0140] The game creation area is also provided with a game selection region **76** comprising a searchable list of games that are awaiting participants. A member searching for a game can browse the list looking for games, which meet their own requirements. The list may be filtered or sorted to assist searching.

[0141] The list entry for each available game includes a game identifier comprising a unique number or alphanumeric code for identifying the game. The list entry also includes the initiating member's user name and rating, any preferred qualification requirements, the game type (e.g. real/virtual/handicapped/'equalized' etc.), the initiating member's color, and any time controls. The current prize fund is also shown along with the status of the game.

Game Play

[0142] As seen in FIG. **6**, the user interface **30** is provided with a game play area **80** for allowing members to participate in real-time online games with other members, guests, and/or computer competitors.

[0143] The game play area **80** is provided with a player region **82**, a spectators region **84**, and a player information region **86**. The player region **82** is the area where the chess game is conducted, and includes a virtual chessboard **90** and associated virtual pieces, a game info area **92** displaying information about the current game, and a communications area **94** for recording the games history and for allowing competitors to chat to one another during the game.

[0144] The game info area **92** includes the game identifier, the initiating member's user name and rating, any time controls, the current prize fund, and the status of the game.

[0145] In operation when a game is set-up, the initiating member waits for another participant to request entry to the game, and the status is shown as "Awaiting Player". Once another member has requested entry into the game, and any wagers and game conditions are agreed, the member making the request is accepted as an opponent. The prize fund is then increased to include the opponent's wager, the game commences and the status is changed to "In Progress".

[0146] The participants in the game move the chess pieces on the board in accordance with standard chess rules and any other agreed rules on game conditions or game play.

[0147] The communications area **94** comprises a commentary/chat dialogue box, in which each valid move is recorded as it is made. If an invalid move is attempted, the participant making the move is prompted that the move is illegal, and the affected piece is returned to its original position. Participants can also chat with each other using the chat dialogue box if they wish.

[0148] The player region **82** is further provided with a timer **96** showing the allotted time the participant has to make their move. As soon as one participant has made a move the other participant is alerted using any suitable alert means, for example an alarm or a flashing screen. A similar alert is also provided to warn a participant that time is running out for a particular move.

[0149] The player region is also provided with a flip board button **98**, a raise stakes button **100** and a take a break button **102**. The flip board button **98** allows the participants to flip the board, in operation, for example to view the position from their opponent's perspective.

[0150] The raise stakes button **100** allows participants to raise the prize fund in the game by an agreed amount. The button **100** becomes available at a pre-determined interval, for example on every tenth move and on every fifth move thereafter. On selection of the raise-stakes button a new window is provided in the user interface **30** of the participant who selected it. The new window allows the participant to enter or select an amount, which they propose to raise the prize fund by.

[0151] Once a proposal is made for a raise in the prize fund, the opposing participant is prompted to accept or reject the proposed raise. If the raise is accepted the prize fund is increased accordingly. Where participants agree to use the odds calculator **34**, the increased contribution to the prize fund, by each participant, may be dependent on their relative ratings.

[0152] The Take a Break button **102** is configured to become available for games having time controls allowing longer than sixty minutes per move. Selection of the button **102** allows participants to suspend the game and to come back later to complete their move. When, in operation, the button **102** is selected, the game is suspended and the participant whose move it is allowed to return at another time to continue. When the move is made an electronic communication is sent to the opponent indicating that the move has been made. The opponent can then return to the chess network, sign in, and make their move. If the opponent is already signed in, and within the relevant game, they can either take their move or select the Take a Break button **102**.

[0153] A game can end for any of a plurality of different reasons including: the failure of a participant to make their move within the time allocated for the move; failure to make a move in a suspended game within a pre-determined period, for example 14 days; deliberate forfeiture by a participant; and conventional chess finishes including stalemate and checkmate. Where a game finishes due to the failure to make a move, the participant whose turn it is forfeits the game. A participant can also decide to forfeit a game by selecting a Give Up button **104** provided for the purpose, and on a resulting confirmation prompt confirming their intention to give up.

[0154] The player information region **86** is provided with a join game button **106**, which is available for selection when the game is awaiting a participant. In operation, a prospective opponent entering the game play area **80** selects the join game button **106** to request entry to the game. This generates infor-

mation about the prospective opponent in the player information region **86**, for review by the initiating member who set the game up. Several prospective opponents can be listed in the player information region **86**.

[0155] The initiating member is then free to decide which prospective opponent, if any, they wish to accept the request for entry from. For each prospective opponent, the player information region **86** is provided with an accept button **108** and a reject button **110**, to allow the initiating member to make their decision.

[0156] Prospective opponents are removed from the list in the player information region **86** when they are rejected, when they leave the game play area **86**, or when the initiating member accepts the request for entry of a different prospective opponent.

[0157] The spectator region **84** is only available to non-participants in the game. Web-controls are provided in the spectator region **84** to allow spectators to watch a game that is in progress and to chat to one another. A list of spectators viewing the game is provided in the spectator region **84** to allow spectators to interact with one another.

[0158] It will be appreciated that game play has been described in simple terms and that a skilled person would be able to implement other useful features that are common to online chess games. For example, the participants may be provided with controls allowing them to change the initial board set-up, to add/remove pieces during game play by mutual agreement, to set up chess problems for solving by other members etc. Such features would also be beneficial in allowing members to tutor and train other members. Other features may include features to allow cosmetic changes to features such as background color, piece style or the like.

[0159] It will be further appreciated that many features described will be subject to statutory restrictions in certain jurisdictions and that such features will only be accessible to the extent that national law allows in the jurisdiction of a user wishing to benefit from those features.

1. A method for automatically determining game characteristics for at least one participant in a turn-based game of skill, the method comprising:

- (a) determining or accepting a first numerical rating associated with said first participant;
- (b) determining or accepting a further numerical rating associated with a further participant in said game; wherein said first and further ratings are indicative of an ability level of said first and further participants, to the extent said ability level is known;
- (c) calculating a likelihood of a scenario, said scenario being representative of a specific outcome to said game, said likelihood being a mathematical function of said first and further numerical ratings;
- (d) generating a game characteristic for said proposed game between said first and further participants based on said calculated likelihood.

2. A method as claimed in claim 1, further comprising: accepting a first stake value from said first participant; calculating a return due said first participant if said scenario is realised, said return being a function both of said stake value and said likelihood of said scenario.

3. A method as claimed in claim 2, further comprising: calculating a further stake value for said further participant in dependence on said calculated return and said first stake value.

4. A method as claimed in claim 2 wherein said calculated return is a function of an associated fee.

5. A method as claimed in claim 1, further comprising:
accepting a prize fund value;
calculating a stake value for each of the first and further participants in dependence on said prize fund value.

6. A method as claimed in claim 5 wherein said calculated stake values are each a function of an associated fee.

7. A method as claimed in claim 1 wherein said specific outcome is a win by said first participant.

8. A method as claimed in claim 1 wherein said specific outcome is a draw.

9. A method as claimed in claim 1 wherein said game of skill is a game of chess or a variant thereof.

10. A method as claimed in claim 1 further comprising:
adjusting said rating associated with at least one of the first and further participants in dependence on an actual outcome of said game, on completion of said game.

11. A method as claimed in claim 1 wherein the generation of said game characteristic comprises:

generating a handicap for at least one of the first and further participants based on said likelihood;

generating a virtual rating for at least one of said first and further participants based on said handicap, and the or each associated numerical rating;

recalculating said likelihood of said scenario, using each generated virtual rating in place of the associated numerical ratings;

generating betting odds based on said calculated likelihood.

12. A method as claimed in claim 11 wherein said handicap is generated such that said that each participant has an approximately equal chance of winning the game.

13. A method as claimed in claim 1 wherein the generation of said game characteristic comprises:

generating a goal for a corresponding one of the first and further participants based on said likelihood, wherein on achievement of said goal said associated participant is designated winner of said game;

said goal being such that each participant has an approximately equal chance of winning the game.

14. A method as claimed in claim 13 wherein said goal comprises playing the game for a predetermined number of moves without losing the game.

15. A method as claimed in claim 13 wherein said goal comprises achieving a predetermined number of points or else preventing another participant achieving a predetermined number of points.

16. A method as claimed in claim 1 wherein said method is implemented on a central computer in a communications network.

17. A method as claimed in claim 16 wherein said communications network comprises the Internet.

18. A method as claimed in claim 16 wherein said communications network comprises a mobile phone I cell phone network.

19. A method as claimed in claim 1 wherein said method is implemented as stand alone application on an electronic device.

20. A method for automatically determining odds for a wager placed by a first participant in a game of skill, the method comprising:

(a) determining or accepting a first numerical rating associated with said first participant;

(b) determining or accepting a further numerical rating associated with a further participant in said game;

wherein said first and further ratings are indicative of an ability level of said first and further participants, to the extent said ability level is known;

(c) generating odds for a scenario, said scenario being representative of a specific outcome to said game, said odds being based on said first and further numerical ratings.

21. A method of automatically determining game characteristics for at least one participant in a turn-based game of skill, the method comprising:

(a) determining or accepting a first numerical rating associated with said first participant;

(b) determining or accepting a further numerical rating associated with a further participant in said game;

wherein said first and further ratings are indicative of an ability level of said first and further participants, to the extent said ability level is known;

(c) determining a differential relationship between said first and further numerical rating;

(d) generating a goal for an associated one of said players based on said differential relationship, wherein on achievement of said goal said associated player is designated winner of said game, said goal being biased in the favour of one participant so as to reduce a likelihood of the participant having a greater ability level winning the game.

22. A method as claimed in claim 21 wherein said game is chess or a variation thereof.

23. A method as claimed in claim 22 wherein said goal for said associated player is to capture a predetermined number of chess pieces from an opposing player before said opposing player obtains checkmate.

24. A method as claimed in claim 22 wherein said goal for said associated player is to capture chess pieces to a combined value equal to or exceeding a predetermined value from an opposing player before said opposing player obtains checkmate.

25. A system for automatically determining game characteristics for at least one participant in a turn-based game of skill, the system comprising:

input means for determining or accepting a first numerical rating associated with said first participant and a further numerical rating associated with a further participant in said game, wherein said first and further ratings are indicative of an ability level of said first and further participants, to the extent said ability level is known;

processing means for calculating a likelihood of a scenario, said scenario being representative of a specific outcome to said game and said likelihood being a mathematical function of said first and further numerical ratings;

wherein said processing means is arranged to generate a game characteristic for said proposed game between said first and further participants based on said calculated likelihood; and,

display means for communicating the game characteristic to a user.

26. A system for automatically determining game characteristics for at least one participant in a turn-based game of skill, the method comprising:

input means for determining or accepting a first numerical rating associated with said first participant and a further numerical rating associated with a further participant in

said game, wherein said first and further ratings are indicative of an ability level of said first and further participants, to the extent said ability level is known; processing means arranged to determine a differential relationship between said first and further numerical rating; wherein said processing means is arranged to generate a goal for one of said players based on said differential relationship, such that on achievement of said goal said player is designated winner of said game, said goal being biased in the favour of one participant so as to reduce a likelihood of the participant having a greater ability level winning the game.

27. A data carrier for operation of a system for automatically determining game characteristics for at least one participant in a turn-based game of skill, the data carrier comprising machine readable instructions for operation of said system to:

- (a) determine or accept a first numerical rating associated with said first participant;
- (b) determine or accept a further numerical rating associated with a further participant in said game; wherein said first and further ratings are indicative of an ability level of said first and further participants, to the extent said ability level is known;
- (c) calculate a likelihood of a scenario, said scenario being representative of a specific outcome to said game, said likelihood being a mathematical function of said first and further numerical ratings;
- (d) generate a game characteristic for said proposed game between said first and further participants based on said calculated likelihood.

28. A data carrier comprising machine readable instructions for operation of a system according to claim **26**.

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