The quality of play at the Candidates

4/8/2013 – We all enjoyed a very high level of play demonstrated by some of the top human chess players in the FIDE Candidates Tournament, London 2013. However, what was the exact quality of play in these games – and can this be measured? Can we compare it objectively to the quality of play in previous World Championship matches? Matej Guid and Ivan Bratko make an attempt.

Candidates Tournament 2013: Computer Assessment of Quality of Play

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In this paper we attempt to get some answer to the questions formulated in the header, through a computer analysis of the individual chess moves played by the players. Strong chess engines and increasingly powerful computer hardware provide us with opportunities to observe more than just pure game results. As we all know, a single mistake may ruin a well-played game. Game results do not necessarily reflect well the quality of play – that is for sure. Besides, quality of play seems to have improved greatly with the emergence of huge databases of chess games and very strong chess engines.

In this article, we briefly present results of computer analysis of chess games played in the latest Candidates Tournament in London, using the chess engine Houdini 1.5a (64 bit) at search depth of 20 plies. In our previous studies (see e.g. the Chessbase.com article Using chess engines to estimate human skill) we demonstrated that (fallible) chess engines can produce quite reliable rankings of the players. Possibly surprisingly, it turns out that different engines at different search depths produce the same or at least very similar rankings. The method is briefly described below. While the method could be debated, it can nevertheless give us some insights about the quality of play in the games analysed.

FIDE Candidates Tournament 2013

According to the 20-ply Houdini, Magnus Carlsen achieved the best computer score at the FIDE Candidates Tournament 2013. Probably the greatest surprise is an excellent computer score by Alexander Grischuk, who finished the tournament with less than 50% points in the tournament table! According to the analysis, Vladimir Kramnik also played at a very high level.

FIDE Candidates 2013 computer scores:
(lower scores indicate the better quality of play)

The results suggest that the quality of play demonstrated by the Candidates is very high indeed. In particular, Carlsen’s score is the second best score achieved in an individual tournament or match of all the top-level tournaments and matches that we have analysed to the present day.

Let us note that both Carlsen’s and Kramnik’s computer score greatly deteriorated in the last few rounds. After Round 10 their scores were both under 3.00, which is truly remarkable: we will see that shortly, as we will compare the results in the graph above to the achievements of the 15 classical world champions at the peaks of their careers – in the World Chess Championship matches.

The “classical” World Chess Championship matches (1886–2012)

In the graph below, we see corresponding results obtained with the same program at the same level of search (i.e. Houdini at 20 plies).
The comparison of the world chess champions
(lower scores indicate the better quality of play)

The results suggest that in terms of the computer scores, Vishy Anand and Vladimir Kramnik did best of all the players in the World Chess Championship matches. It should be noted that several players achieved rather similar scores.

By comparing the two graphs we can observe that the top three 2013 Candidates (Carlsen, Grischuk, and Kramnik) achieved even better computer scores than were the average scores of any of the fifteen “classical” world champions in the “classical” World Championship matches!

What about the champions’ achievements in their individual World Championship matches? Here is the Top-10 list of individual achievements, using the same program at the same depth of search:

The top 10 scores in the “classical” World Championship matches
(lower scores indicate the better quality of play)

The best quality of play (as judged by Houdini 1.5a at 20-ply search) was therefore demonstrated by Kramnik in his World Championship match against Leko. As noted above, both Carlsen and Kramnik were on the way to achieve an even better score in the first ten rounds of the FIDE Candidates Tournament.

A brief description of the method
The method used to obtain the results presented in this article is described in the following scientific paper:


Here is a summary of the method (see the above paper for explanations):

- The analysis of each game starts at move 12.
- The chess engine evaluates the best moves (according to the computer) and the moves played by the player.
- All engine’s evaluations are obtained at the same depth of search.
- The score is then the average difference between evaluations of the best moves and the moves played.
If the player’s mistake (as seen by the engine) at particular move is greater than 3.00, the score for this particular move becomes 300 “centipawns” (to avoid unreasonably high penalties for gross mistakes).

Moves where both the move played and the move suggested by the computer had an evaluation outside the interval [-2.00, 2.00], are discarded. (In clearly won positions players are tempted to play a simple safe move instead of a stronger, but risky one. Such “inferior” moves are, from a practical viewpoint, perfectly justified. Similarly, in lost positions players sometimes deliberately play an objectively worse move.)

In the graphs above, all the scores are given in “centipawns”.

We would like to emphasize that the scores obtained by the program only measure the average differences between the players' choices of move and the computer's choice. Several studies have shown that these scores that are relative to the chess engine used have good chances to produce sensible rankings of the players.

A valid comment regarding the computer scoring method is that it does not take into account the complexity of positions. As a consequence, players that tend to prefer simple positions are a priori more likely to commit less errors and therefore obtain better computer scores. To qualify the computer score results from the perspective of complexity, we add the average complexity estimates of individual player’s games. These complexity estimates were computed by the method described in the scientific paper M. Guid and I. Bratko: Computer analysis of world chess champions. ICGA Journal, Vol. 29, No. 2, pp. 65–73, 2006.

Again, the chess engine Houdini 1.5a (64-bit) was used to compute the complexity estimates, this time (in accordance with the algorithm) performing search to various depths in the range between 2 and 15 plies.

The average complexity estimates of individual player’s games in the World Championship matches (left) and in the FIDE Candidates 2013 (right). The lower scores indicate tendency towards simple positions.

These results confirm previous observations that Capablanca’s outstanding score in terms of low average differences in computer evaluations between the player’s moves and the computer’s moves should be interpreted in the light of his playing style that tended towards low complexity positions.

It is worth noting that according to the results demonstrated in the graph above, Aronian dealt with the most complex positions (on average) of all the Candidates. On the other hand, Carlsen’s outstanding computer score (the estimated quality of play) does not in any way seem to be the consequence of the level of complexity of positions that occurred in his games.

The authors

Matej Guid has received his Ph.D. in computer science at the University of Ljubljana, Slovenia. His research interest include computer game-playing, automated explanation and tutoring systems, heuristic search, and argument-based machine learning. Some of his scientific works, including the Ph.D. thesis titled Search and Knowledge for Human and Machine Problem Solving, are available on Matej’s Research page. Chess has been one of Matej’s favourite hobbies since his childhood. He was also a junior champion of Slovenia a couple of times, and holds the title of FIDE master.
Ivan Bratko is professor of computer science at University of Ljubljana, Slovenia. He is head of Artificial intelligence Laboratory, Faculty of Computer and Information Science of Ljubljana University, and has conducted research in machine learning, knowledge-based systems, qualitative modelling, intelligent robotics, heuristic programming and computer chess (do you know the famous Bratko–Kocev test?). Professor Bratko has published over 200 scientific papers and a number of books, including the best-selling Prolog Programming for Artificial Intelligence. Chess is one of his favourite hobbies.

References

- Chessbase: Computers choose: who was the strongest player? 30.10.2006.
- Chessbase (reader’s feedback): Computer analysis of world champions. 2.11.2006.

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See also
Tata Steel Chess – Round 13 Round-up

1/27/2019 – The 81st Tata Steel Chess Tournament takes place from January 12th to 27th in Wijk aan Zee, the Netherlands (and two "on tour" locations). The "Masters" has an average Elo of 2753. The "Challengers" weighs in at 2582. Both are 14-player round-robin tournaments. Round-up show live at 20:00 UTC (21:00 CET, 3:00 PM EST) Live commentary by IMs Sopiko Guramishvili and GM Robert Hess from 12:30 UTC (13:30 CET, 7:30 am EST) | Photo: <a href="http://TataSteelChess.com">TataSteelChess.com</a>

World Championship 2018 – Closing Ceremony LIVE

11/28/2018 – The moment we've all been waiting for! Live games (for Premium members) from the 2018 World Championship match in London. Every two games will be followed by a rest day until Game 12 (if necessary) on November 26th which will be preceded by an additional rest day. All rounds start at 15:00 UT (London time) / 16:00 CEST / 10:00 EST. If needed there would be a rapid tiebreak match on Wednesday, November 28th. | Photos: Patricia Claros
Rules & regulations for the Candidates Tournament of the FIDE World Championship cycle 2011-2013.

1. Organisation.

1.1 The Candidates Tournament to determine the challenger for the 2013 World Chess Championship Match shall be organised in the first half of 2013 and represent an integral part of the World Chess Championship regulations for the cycle 2011-2013. Eight (8) players will participate in the Candidates Tournament and the winner qualifies for the World Chess Championship Match in 2013.

1.2 Governing Body: the World Chess Federation (FIDE).

Now that the first round of the FIDE Candidates tournament is just two days away, it’s high time for some predictions! Will it be a walk in the park for Magnus? Can we expect surprises from outsiders like Svidler or Gelfand? Will Ivanchuk be the decisive factor in the end? GMs Fabiano Caruana, Ruslan Ponomariov, Gawain Jones and Erwin l’Ami look forward to London 2013 and give their predictions.

Tomorrow at 18:00 local time the opening ceremony of the FIDE Candidates will be held at the tournament venue: the IET at Savoy Place in London. Then, on Friday, March 15th the first round will start at 14:00 GMT: Aronian–Carlsen, Gelfand–Radjabov, Ivanchuk–Grischuk and Svidler–Kramnik. It will be a historical event and the whole chess world is waiting for it!

Beat the Slav the classical way

The Slav has become one of the most popular defences against the advance of the d-pawn on the first move, and every ambitious d4–player faces the question how to successfully tackle this opening in tournament practice. The strongest attempt is considered to be the move 4. Nf3, leading to interesting positions which promise White good chances to get an advantage. Black’s main replies are 4. dxc4 and 4. e6. On this DVD Rustam Kasimdzhanov investigates in detail the line 4. dxc4, in which he has great experience. Showing selected grandmaster games, the ex-world champion shares his knowledge with the viewer to explain how White has to place his pieces and which plans he has at his disposal. Learn the secrets of the dxc4–line and improve your chances of success with 1.d4.