

**... but they need to use their own brains!!**  
or  
**Chess Engines: the death of correspondence chess?**  
by Simon Hradecky

Whenever you join discussions about correspondence chess, you will find arguments right away that chess engines have become so good these days that humans cannot win anymore against them. This argument also seems to be supported by the outcome of the recent competition in which Grandmaster Arno Nickel (with the help of computers) played correspondence games against six different chess engines and lost overall. That even leads to conclusions that the chess engines are the death of correspondence chess and should be banned. However, I am convinced otherwise, and my own experience seems to support my conviction fully.

Human brains are fantastic inventions of nature. Flexible, innovative, creative, adaptive, always on the lookout for something new, yet learning and adding knowledge at the same time. We want to explore things. However, as fascinating as the brain is, it has disadvantages: it is not reliable and predictable. We overlook things, we forget things, we are impatient, we sometimes lose temper, we get caught in mindsets and so on.

Computers are fantastic inventions of mankind. Reliable, patient, predictable, sticking to given procedures and knowledge. Computers, as fascinating as they are, have disadvantages: they do not learn (unless being reprogrammed by humans), they do not explore new things, they cannot deviate from their given procedures and knowledge.

Looking at these properties of the human and artificial brain, are they not completely opposed to each other? Of course, they are. It looks like computers are the perfect complement to human brains – if we pair human intelligence, innovation and ideas with the accuracy and reliability of machines, would we not perform significantly better than either human beings or computers alone?

Did I just say, that chess engines are reliable, do not get caught in mindsets and do not make mistakes? Well, somehow I did, but that statement needs to be put into perspective: accuracy and reliability comes at a high price, namely performance. To compute a position at full accuracy, chess engines need to check all possible moves, all their counter moves and so on – so their ability to look ahead and see developments is vastly limited. To compensate for that, chess engines use different criteria to select the possible moves, which they analyse further, while they just do not follow up the other ones. Only that “trick” allows them to look as far ahead as they do today and to develop their current strength.

To give you an example: in a middle game, where each position allows for typically 30 different continuing moves, the engines would need to look at 531.440.000.000.000 positions for a reflection depth of 12 half moves (ply 12) – and we know, that chess engines are not anywhere competitive at that level! –, which at average Fritz speed of 1.200.000 positions per second takes 442.860.000.000 seconds or more than 14000 years to compute. When the chess engines now limit the number of moves, they look on, to 4 in average, they need to look at 16.777.216 positions only and need a reflection time of about 14 seconds. At the same time the engines, however, may overlook the stronger, perhaps winning move amongst the remaining 26. As a result, chess engines, too, get caught in “mindsets” and make mistakes, just like humans.

A classic example of a chess engine’s mistake occurred in the eighth World Championship game between Vladimir Kramnik and Peter Leko in Brissago/Switzerland 2004,

<http://www.chessbase.com/newsdetail.asp?newsid=1945>

when chess engines computed the queen sacrifice by Kramnik, move 24.Qxe2, as winning for Kramnik and continued to show winning advantage for more than 15 minutes into evaluating the position after Leko’s entirely winning 25...Qd3!!, before the engines started to doubt and

reduce the score. Kramnik confirmed later in the press conference that this queen sacrifice was prepared and checked using chess engines during his preparation.

Another argument, often brought up in discussions about chess engines and their impact especially on correspondence chess, is that the introduction of chess engines brought the weaker players closer to the stronger players, closing the gap between low rated and high rated players. At the same time, arguments were raised that some of the top players, including an ICCF World Champion, could achieve their good performance only by use of a whole computer farm, continuously running one or more chess engines for each game in progress. Conclusions were drawn that good success only depends on money. So let us look a bit closer at that line of arguments.

Above I already raised the question, whether or not pairing human intelligence, innovation and ideas with the accuracy and reliability of computers would be stronger than either human beings or computers alone. In my opinion there is no doubt that the answer to this question is a clear "yes". The gap between strong players using chess engines and the weak players using chess engines remains because being produced by the different human skills in chess, and the stronger player will still win against the weaker player. In other words, the chess engine used by White is neutralized by the chess engine used by Black, and the decisive difference between the players is again their own chess skills!

Now, does that not invalidate the money argument, too? Would a strong player using one computer, shared for all games in progress, not be able to create the decisive difference again to win against a weaker player, who uses one computer per game and has it continuously analysing the game?

I think it is worth to go a bit more into that argument, again using the performance of a chess engine. Let us again assume, the chess engine looks at four possible moves for each position, and computes their countermoves. At ply 1 it is obvious: the engine would look at 4 positions ( $=4^1$ ). At ply 2 computing the 4 countermoves for each of the 4 initial moves it would look at 16 ( $=4^2$ ) positions, and so on. At a ply of 17 we would be looking at  $4^{17}=17179869184$  positions or 4 hours of reflection, at a ply of 19 that is already 64 hours, and at a ply of 20 we would be looking at more than 10 days of reflection time (which already is above average allowance of reflection time in ICCF tournaments). To increase reflection depth by one more additional level, the chess engine already needs more than a month. Chess engines' adaptive selections of how many moves get looked into more closely may reduce the average number of analysed moves even further (sometimes as low as 2), nonetheless you will find the same time constraints again though at some higher ply counts.

Now, how much benefit does the additional level of reflection depth add in reality? I do not doubt for one split second that the additional reflection depth enables the chess engine to select an even better move. However, is the benefit achieved in such extreme reflection times indeed more than a human player's experience and skills can contribute to a game? No way! As a classic example I recommend to try refuting Max Zavarelli's fascinating "Sleeping Beauty" game against Jaromir Canibal, Reg Gillman Memorial 2000, with your favourite chess engine at whatever ply level you are patient enough to bear. The game is fully annotated at:

[http://www.iccf.com/articles/gotm\\_2001\\_05.shtml](http://www.iccf.com/articles/gotm_2001_05.shtml)

Did chess engines change correspondence chess? Yes, they did, significantly so. If we look at games of the times before chess engines, we frequently find bad mistakes in the games, more often, of course, in the play of weaker players, many of the games being decided by blunders. Today, we do not see such blunders anymore, even at low-level tournaments.

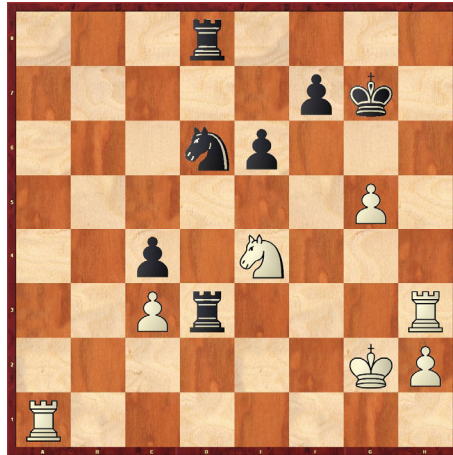
The requirements on players have changed, too. Besides their chess skills and knowledge players now need to know, how to use chess engines efficiently and complementary to their own skills. Players now need to know the strengths and limits of their chess engines.

Rather than theorize any further, I would like to demonstrate some of the key elements, I observed in my own recent games within WC27SF10, namely Wladyslaw Król – Simon

Hradecky, Jaroslaw Sawiniec – Simon Hradecky and Simon Hradecky – Joel Martín Clemente. You can view and replay the fully annotated games at:

<http://www.nomissoft.com/chess/wc27sf10.htm>

It became clear to me early into the game that Wladyslaw Król (playing White) trusted Fritz 8 as his analysis tool, though he played several moves that deviated from Fritz's suggestions. After a varied game we approached the endgame, and it became more and more clear, that the game would end in a draw, me not being able to convert my advantage. However, I discovered that Fritz 8 did not evaluate a certain position correctly, and therefore steered the game towards that position, which materialized after my move 40...Nd6! :

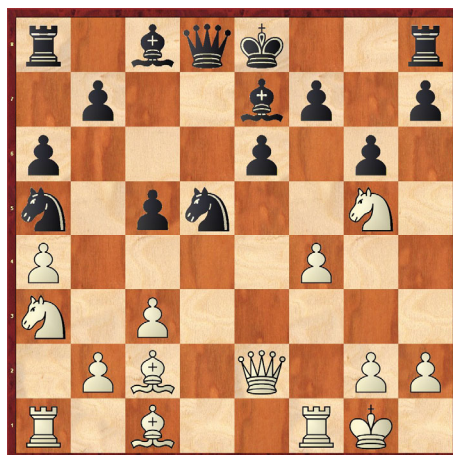


At first sight every human player immediately recognizes, that the white rook must not take the black rook at d3. The black pawn at c4 retakes and becomes a very dangerous threat on the d-file, whereas the white c-pawn is no real threat to Black due to lack of support by both white king and rook (the rook being tied into position by the black d-pawn). However, Fritz favoured 41.Rxd3 very strongly, putting it far ahead of any other move and especially far ahead of the correct sequence to a draw, which would have been 41.Nxd6 R8xd6 42.Rf3!

Consequently, Wladyslaw Król played 41.Rxd3?? and lost the game. Human skills and trust into the own abilities would have saved the draw.

It also needs to be said, that some (but by far not all) other chess engines, for example Chessmaster 9000, "saw" the correct way to a draw.

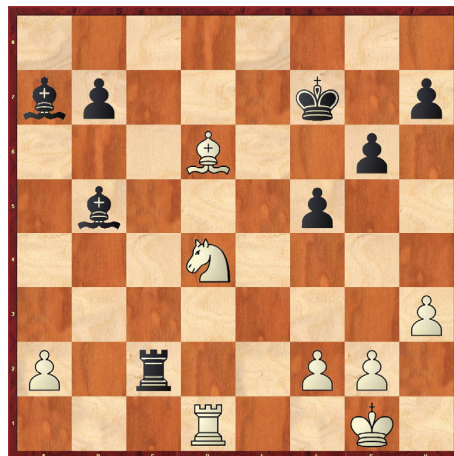
Earlier in the same game an interesting situation had arrived on the board, in which all chess engines performed less than reasonable, as none looked through the position, that had arrived after my move 12...g6:



The chess engines preferred 13.Bd2 at this point, completely overlooking the powerful move 13.Rd1!, as the engines did not "see" the brilliant fireworks, that White could launch after the moves 13...Qc7 or 13...Qb6 – those moves actually reached a very high score in favour of Black by the chess engines.

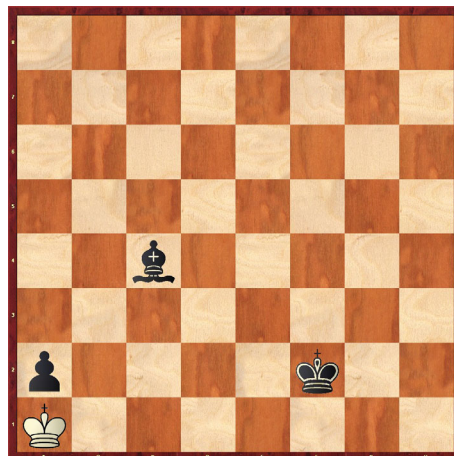
13...Qc7 could have been followed by 14.f5! gxf5 15.Nxf7!!, blowing Black's defence completely open and leading to a quick white win, 13...Qxb6 could have been followed by 14.f5! gxf5 15.Bxf5! Bd7 leading to winning advantage for White. Therefore Black would be forced to play 13...c4 to remain in the game without allowing a decisive advantage to White.

In the game Sawiniec-Hradecky I was occupied with another game, where I had spotted a problem and was devoting almost all of my time to solve that problem, when a crucial position arrived with 36.Nd4! :



It goes without any further mention that the chess engines did not suggest 36.Nd4, but evaluated that move significantly worse than 36.Rd2 (white knight on b3).

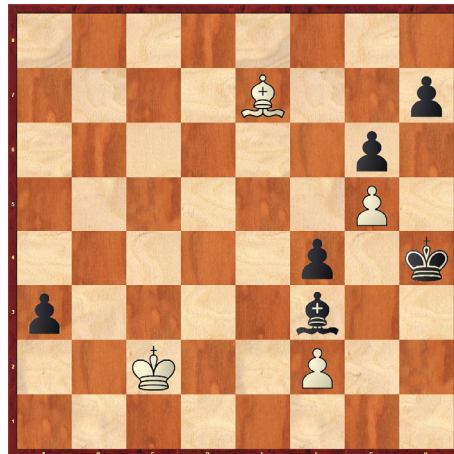
My immediate instinct was to take the knight at d4, but then I realized I would be left with opposite coloured bishops, which strongly favour drawish endgames, and therefore also looked briefly at Be2 to keep the pair of bishops. At the same time I realized, I would win two pawns after taking the knight and have forceful play on both wings of the board. Endgame theory told me, that this game would be won despite the opposite coloured bishops. A check with chess engines also favoured to take on d4. As I didn't want to devote more of my time to this game, that I thought was won anyway, I accepted these results and played 36...Bxd4, thus paving the way to a draw, which in the end, after move 68...Kxf2, looked like this:



With the white king just shuttling between a1 and b2 there is no way for Black to force a win.

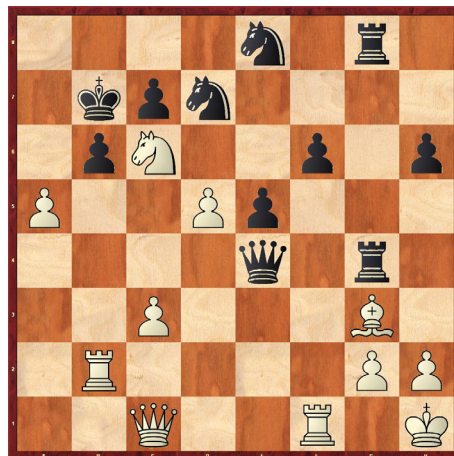


In this game I also played a joke that would have trapped every "postmaster" (a player, who just forwards the best move suggested by his favourite chess engine):



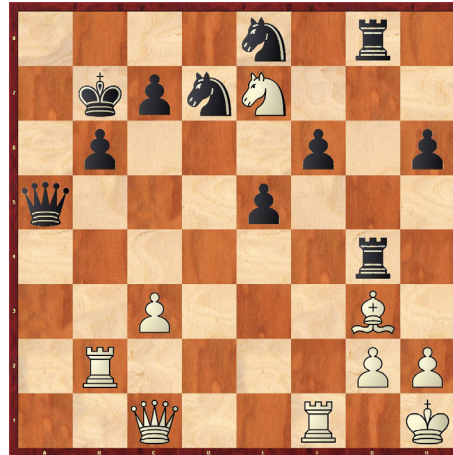
Here I played 49...Bd1+, offering to sacrifice my bishop. All chess engines, without exception, immediately and continuously (at whatever ply count you want to try!), voted to take that bishop with several pawn units difference over the next best move. However, after 50.Kxd1?? a2 51.Bf6 Kg4 52.Kc2 Kf5 53.Kb2 h5! 54.f3 h4 55.Bd4 Kxg5 56.Kxa2 Black has a fully won game, as the black king can capture the pawn at f3 and the white bishop, without the help of his king, isn't able to hold the three combined passed pawns. It speaks for my opponent that he saw through the manoeuvre and continued correctly with 50.Kb1. I believe, that he had fully understood and prepared the endgame before playing his 36<sup>th</sup> move.

Another highly interesting game with regards to both chess engines as well as human psychology is the game Hradecky-Martín Clemente. After move 38.Bg3 the position was:



Chess Engines at this position were not clear between 38...Nd6 and 38...Qxd5, my instinct was to not expect 38...Qxd5, so I analysed 38...Nd6 primarily. However, after a second look and some more analysis I found, that 38...Qxd5 looked pretty sound after recognizing, that the subsequent exchange sacrifice by Black (38...Qxd5 39.Ne7 Qxa5 40.Nxg8) would lead to a draw rather than a win for White.

So I started a full analysis of that branch too, and the more I looked at it, the more it looked like I could not win anymore after 38...Qxd5. One late evening, I was just about throwing the towel for the day, I looked at my scribbles and suddenly spotted, that I had analysed between 3 and 10 variants for each of my subsequent moves, but only had looked at one variant for my move 40, namely 40.Nxg8.



Position after 39...Qxa5

I was so caught in the belief that the knight had to immediately take the rook (after the queen escaped the fork), that I did not at all look at any other of the possible moves.

When I now looked at other possibilities, I immediately discovered 40.Qd2!!, attacking the black knight at d7, my knight at e7 locking the black king into the cage behind the black pawns and thus producing a mate threat on the a-file. Eureka! That is the winning move I transmitted only a few days later, after Joel Martín Clemente played 38...Qxd5 indeed.

I conclude from the response times of my opponent, that he was caught in the very same mindset, expecting to have survived a bad position and achieved a balanced play again, in which a draw was the most likely result. Earlier in the game he had used several days per move, but on entering the combination leading to that position his response times lowered to a few hours per move. Immediately after I played 40.Qd2 his response time rose to some 2-3 weeks per move.

Human psychology, in the form of mindsets, at its best indeed! However, interesting as it is, that mindset was not limited to only humans, but all chess engines were also caught in the same mindset. Not a single engine considered 40.Qd2 in analysing the preceding moves - only after the move was executed, chess engines recognized its power.

Looking at just three games I was able to demonstrate five different positions already, in which chess engines not only failed to compute the correct continuations, but actually lost. All of those games were decided by human brainpower (well supported by computing power), psychology and ideas. Looking into the annotated games you'll find more such positions, e.g. the miraculous move 25...Bc8! in Hradecky-Martín Clemente or 25.Bxa6! in Król-Hradecky.

So, isn't correspondence chess still highly interesting, enjoyable and actually enriched by the chess engines, that tremendously help to avoid bad blunders and allow players to concentrate more on the beauty of the game rather than avoiding mistakes?

For me, the answer is clear: human mind and computing power of chess engines combined in a clever way produce stronger, more interesting, actually thrilling games and enrich correspondence chess. Thus players are able to get more creative than ever before, but - and that's the bottom line - they need to use their own brains!!

Simon Hradecky

<http://www.nomissoft.com/chess>