Chess Exhibition Match between Shannon Engine and Turing Engine

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Abstract

Around 1950, Claude Shannon and Alan Turing were the first two scientists who made concrete proposals for chess programs. Their programs were realised for modern computers a few years ago. We present the games of an exhibition match between the two, ending in a 5-5 tie, as well as some more games against more modern computer programs. It turns out that different approaches in evaluating a position (Shannon: score = score(White) minus score(Black); Turing: score = score(White) / score(Black)) leads to rather different behaviour against other programs.

1. Introduction

Some years ago, Mathias Feist from ChessBase company wrote real programs of the first two chess engines proposed by Claude Shannon and Alan Turing, respectively, around 1950. The engines and short reports (in German) by Mathias Feist can be found online at
http://www.chessbase.de/nachrichten.asp?newsid=9711
http://www.chessbase.de/spotlight/spotlight2.asp?id=15

To find out about their relative strengths on today's hardware we played a 10 games match on a normal PC with about 2.2 GHz processor speed. Computing time was fixed to 15 seconds per move for both engines. The programs do not have opening books and play (almost) deterministically. Therefore, we gave five different short openings for the match:

(a) 1. e3 e6
(b) 1. e4 e5
(c) 1. d4 d5
(d) 1. Nf3 Nf6
(e) 1. c4 f5

For each of these lines two games were played, with reversed colours.

The match ended in a tie, with a total score of 5.0 - 5.0.

Each bot won one of the ten games, the other eight „battles“ ended in draws. All draws were by three-fold repetition of the position. In the majority of the drawn games, Turing's engine had the upper hand. But both programs seemed not to understand the "draw by repetition" rule.

In Shannon's seminal paper [Sha 1950] a passage in Section 2 is interesting with respect to this drawing problem:
> 2. GENERAL CONSIDERATIONS
> A chess "position" may be defined to include the following
> data: -
> (1) A statement of the positions of all pieces on the board.
> (2) A statement of which side, White or Black, has the move.
> (3) A statement as to whether the king and rooks have moved.
> This is important since by moving a rook, for example, the
> right to castle of that side is forfeited.
> (4) A statement of, say, the last move. This will determine
> whether a possible en passant capture is legal, since this
> privilege if forfeited after one move.
> (5) A statement of the number of moves made since the last
> pawn move or capture.
> This is important because of the 50 move drawing rule.
>
> For simplicity, we will ignore the rule of draw after three
> repetitions of a position.

First I thought: “So Shannon took care of a rather complicated thing like the 50 move drawing rule, but at the same time ignored the problem of draws by threefold repetitions.“ But after some meditation I realized that he had very good reasons for this opinion: During the early years of computers machine memory was THE bottleneck, see for instance [Big 1971, pp. 16 and 17] on the problem that a memory with 4,000 bit might work reliably.
A counter for the 50-moves rule needs 7 bit. Storing a single chess position requires between 32 and 20 byte, depending on the level of sophistication. So, the notation of one game with 100 moves would cost at least 2,000 byte = 16,000 bit. Likely Shannon had in mind such amounts when he wrote "for simplicity".

In total, the level of play was very low. For our feeling it was below the strength of the first commercial chess computers (on 2-MHz 8-bit chips C6502) back in 1978. This is not a miracle, because both engines do/did not know about game tree pruning (by alpha-beta or a similar procedure). Feist had programmed them in iterative-deepening manner. In normal positions, with something like 40 feasible moves, each new iteration took about the 40-fold time of the previous one. Observe: In modern chess engines each new iteration takes in average less than 5 times the previous iteration.

2. The Games of the Match

Here the notations for the ten games are given, in pgn format. We did a quick analysis of the games with engine ChessTiger 15.0 (which was one of the best engines back in 2002), and wrote some comments - including evaluations after bad moves by ChessTiger - at the end of each notation. Positive evaluations mean that White is ahead, negative evaluations tell that Black has an advantage. 1.00 means something like one pawn unit plus for White.

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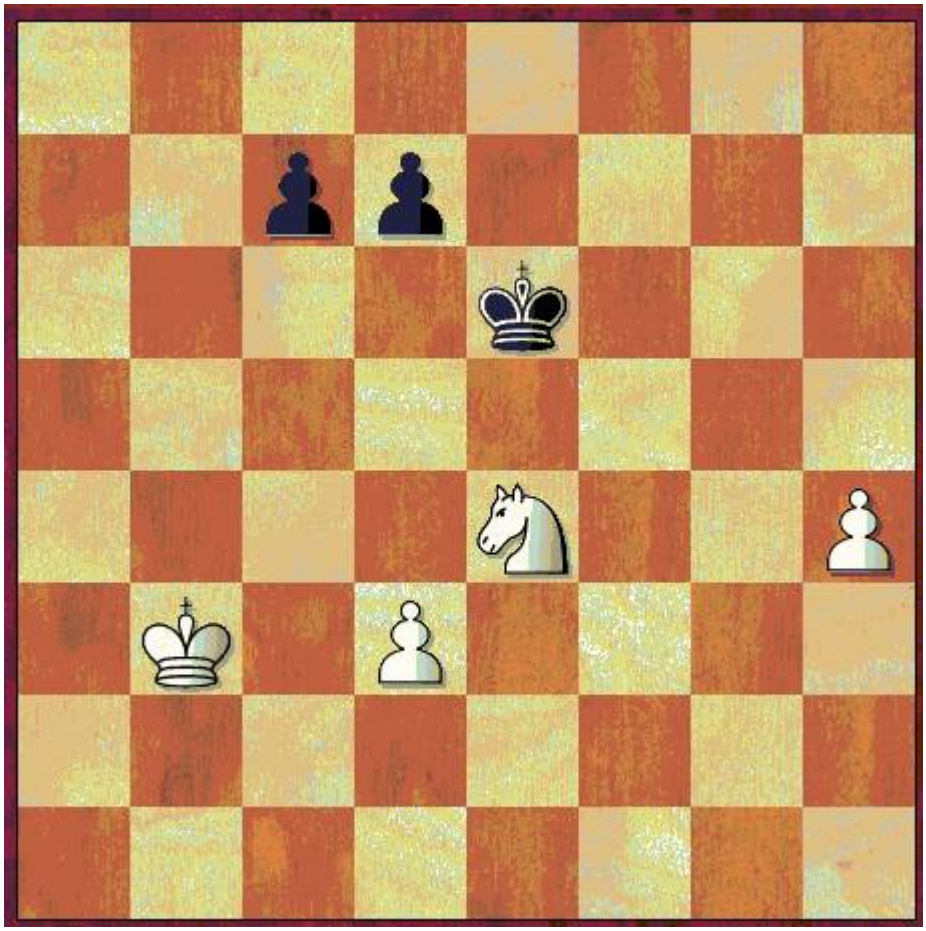
[Date "2012.04.08"]

[Round "1"]
[White "Shannon Engine"]
[Black "Turing Engine"]
[Result "1/2-1/2"]
[PlyCount "59"]
1. e3 e6 2. Qh5 Nc6 3. Bd3 Nb4 4. Nc3 Nxd3+
5. cxd3 Qf6 6. Nb5 Kd8 7. Nf3 Qg6 8. Qxg6 hxg6
9. Ne5 Nh6 10. h4 Be7 11. Ke2 b6 12. d4 Ba6
13. a4 c6 14. d3 cxb5 15. e4 bxa4 16. Bxh6 gxh6
17. Nxf7+ Kc7 18. Rac1+ Kb7 19. Nxh8 Rxh8 20. h5 a3
21. bxa3 Bxa3 22. Rc2 gxh5 23. Rxh5 Bd6 24. d5 Bc5
25. dxe6 dxe6 26. Rb2 Kc7 27. Ra2 Kb7 28. Rb2 Kc7
29. Ra2 Kb7 30. Rb2 1/2-1/2

Big errors were 12.d4 (-4.2), 15...bxa4 (-1.5), 16...gxh6 (-0.5), 18.Rac1 (-2.0). At move 26.Rb2, when the repetition occurred the evaluation was still around -2.0 . The final position should be a rather easy win for Black.

[Round "2"]
[White "Turing Engine"]
[Black "Shannon Engine"]
[Result "1/2-1/2"]
[PlyCount "115"]
1. e3 e6 2. Nc3 Qg5 3. Nh3 Qe5 4. Qg4 Nf6
5. Qd4 Qxd4 6. exd4 Nc6 7. Nb5 Bd6 8. Be2 Ke7
9. a4 Nb4 10. Kd1 a5 11. Ra3 Ne4 12. Re3 f5
13. c4 b6 14. Bf3 Ba6 15. Nxd6 Kxd6 16. d3 Nf6
17. Bxa8 Rxa8 18. Rg3 Rg8 19. Re1 Ng4 20. Bf4+ Kc6
21. Rf3 Kb7 22. Ng5 Rh8 23. h4 Kb8 24. Re2 Bb7
25. Rg3 Bc6 26. b3 Bb7 27. Bc1 Ka7 28. c5 Bd5
29. cxb6+ Kxb6 30. Rb2 Na2 31. Rxa2 Bxb3+ 32. Rc2 Nxf2+
33. Kd2 Bxc2 34. Kxc2 Ng4 35. Rf3 Nh2 36. Rh3 Ng4
37. Bd2 Nf2 38. Rf3 Ng4 39. d5 Ne5 40. Be3+ Kb7
41. Rf1 Ng4 42. Bd2 exd5 43. Rxf5 Nf6 44. Bxa5 Ra8
45. Bc3 Rxa4 46. Bxf6 gxf6 47. Nxh7 Ra2+ 48. Kb3 Rxg2
49. Nxf6 Kc6 50. Rxd5 Rf2 51. Rc5+ Kxc5 52. Ne4+ Kd4
53. Nxf2 Ke5 54. Ne4 Ke6 55. Ng5+ Ke5 56. Ne4 Ke6
57. Ng5+ Ke5 58. Ne4 1/2-1/2

Gradually, Black (=Shannon) lost ground, White won the exchange at move 18. At move 50 White (=Turing) was up a full knight and also had a distant passed pawn. This resulted in a +5.0 evaluation. At the end it was knight + 2 pawns versus 2 pawns, when White ran in an unforced repetition.



Game 2: Position after 54... Ke6

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[Round "3"]
[White "Shannon Engine"]
[Black "Turing Engine"]
[Result "1/2-1/2"]
[PlyCount "90"]
1. e4 e5 2. Qh5 Qf6 3. d4 exd4 4. Qa5 Nc6
5. Qxc7 Bd6 6. Bg5 Qe6 7. Qxd6 Qxd6 8. Bd2 f5
9. exf5 Qe5+ 10. Kd1 Nh6 11. Bxh6 gxh6 12. Nf3 Qxf5
13. Bd3 Qf4 14. Re1+ Kf7 15. Re4 Qd6 16. Bc4+ Kg7
17. Rg4+ Kf6 18. Nbd2 Ke7 19. Ne4 Qb4 20. Rg7+ Kd8
21. b3 b6 22. a3 Qa5 23. Nd6 Kc7 24. Nb5+ Kb7
25. Rb1 Rb8 26. b4 Qa4 27. Kd2 Ka8 28. Re1 Rb7
29. Nbxd4 Qxa3 30. b5 Nxd4 31. Nxd4 Qb4+ 32. c3 Qxc4
33. f4 Rg8 34. Rxg8 Qa2+ 35. Kd3 Qxg8 36. g3 a6
37. bxa6 Rc7 38. Kd2 Kb8 39. a7+ Rxa7 40. Ke3 Ra2
41. Re2 d6 42. Nc6+ Kc7 43. Nd4 Kb8 44. Nc6+ Kc7
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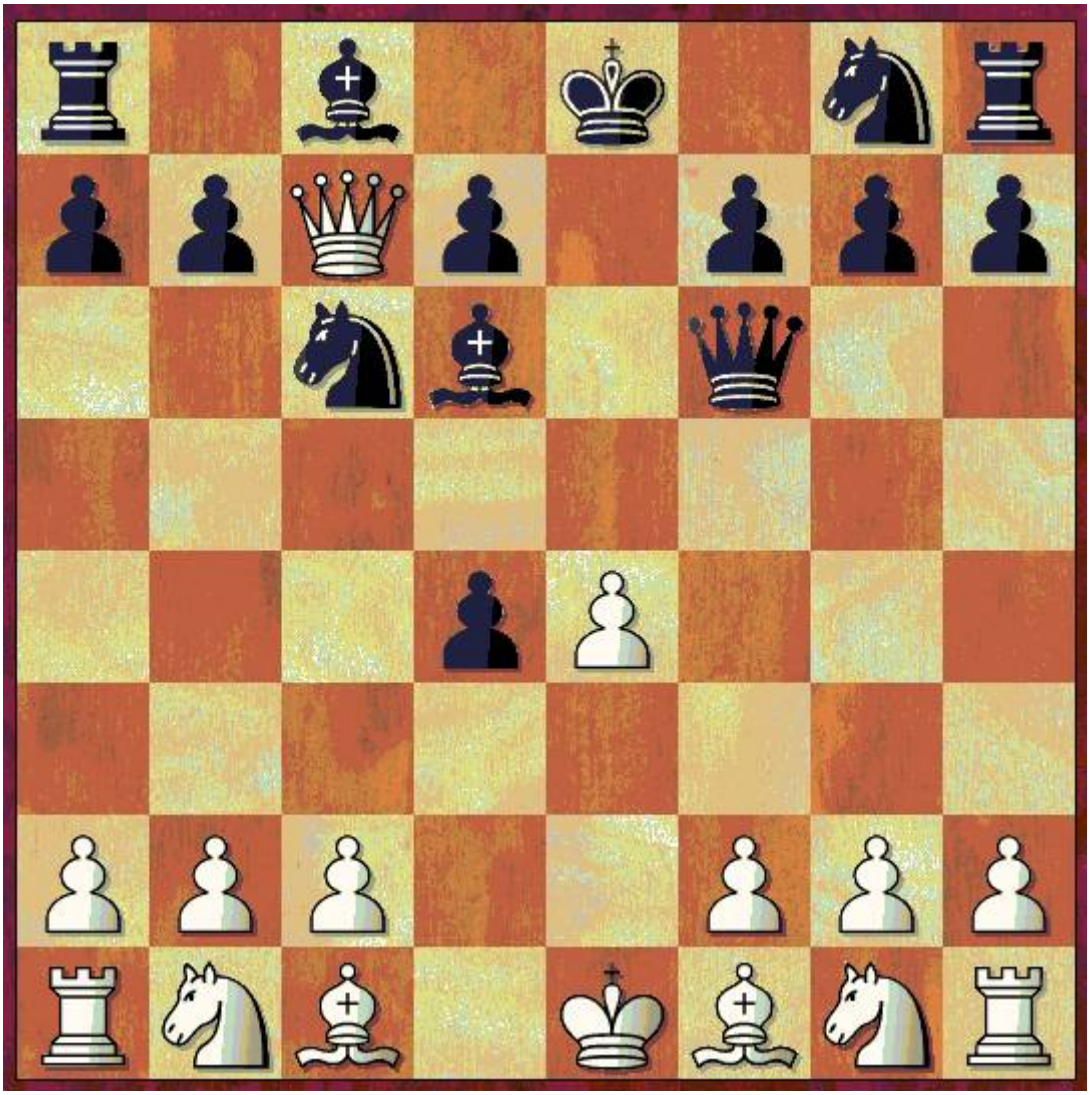
45. Nd4 Kb8 1/2-1/2

Move 5.Qxc7?? was a catastrophe, losing the queen for a bishop after 5... Bd6. The evaluation jumped to -7.1 . It is a sort of miracle that Black did not bring this won game home.



Game 3: Position after 5... Bd6

When Black at the end allowed the draw by repetition the evaluation was around -15.0 according to ChessTiger.

[Round "4"]
[White "Turing Engine"]
[Black "Shannon Engine"]
[Result "1/2-1/2"]
[PlyCount "69"]
1. e4 e5 2. Nc3 Qh4 3. d4 Bb4 4. dxe5 Bxc3+
5. bxc3 Qxe4+ 6. Qe2 d5 7. Qxe4 dxe4 8. Rb1 Nc6
9. f3 Nge7 10. fxe4 Rb8 11. Nf3 Be6 12. a4 Kd7

13. Be2 Ba2 14. Rb5 a6 15. Rb2 Be6 16. O-O Na5
17. Ng5 Nc4 18. Bxc4 Bxc4 19. Nxf7 Bxf1 20. Nxh8 Bc4
21. Rb4 Ba2 22. e6+ Kxe6 23. Rb2 Rxh8 24. Rxa2 Rf8
25. Rb2 b6 26. Rb4 Nc6 27. Rc4 Kd7 28. Be3 a5
29. h4 Ne5 30. Rd4+ Ke6 31. Bg5 Nf7 32. Bf4 Ne5
33. Bg5 Nf7 34. Bf4 Ne5 35. Bg5 1/2-1/2

By the early exchange of queens, both bots were able to avoid tactics and big blunders for some time.

After 17... Nc4? the evaluation jumped to about +3.0, but White missed the opportunity 18. Nxe6. Instead, for some moves even Black got a serious advantage (-2.5). But after 24... Rxh8 things had leveled out again. The resulting endgame was drawish, and the repetition of moves a proper decision.

[Round "5"]
[White "Shannon Engine"]
[Black "Turing Engine"]
[Result "0-1"]
[PlyCount "126"]
1. d4 d5 2. Qd3 Qd6 3. Nc3 Nc6 4. Nb5 Qb4+
5. c3 Qa5 6. Bf4 e5 7. dxe5 a6 8. Nd4 Nd8
9. Bg5 c6 10. a4 Bg4 11. b4 Qc7 12. h3 Bh5
13. Qf5 g6 14. Bxd8 Rxd8 15. Qg5 h6 16. Qf4 Be7
17. a5 Nf6 18. g4 c5 19. bxc5 Qxc5 20. Rc1 Ng8
21. h4 g5 22. Qf3 Qa3 23. Rb1 Bg6 24. e4 Bxe4
25. Bb5+ axb5 26. Nxb5 Bxf3 27. Nxa3 Bxh1 28. Nc2 Be4
29. Kd2 h5 30. Rxb7 d4 31. Rb2 dxc3+ 32. Kxc3 Rc8+
33. Kd2 Rxc2+ 34. Rxc2 Bxc2 35. Kxc2 gxh4 36. g5 Bxg5
37. Nf3 Bd8 38. a6 Rh6 39. a7 Rc6+ 40. Kd2 Ra6
41. a8=Q Rxa8 42. Kc2 Ra4 43. Kb3 Rf4 44. Ng1 Rxf2
45. Kc4 Rf1 46. Nh3 Rf3 47. Ng1 Rg3 48. Ne2 Rg2
49. Nd4 Rg4 50. Kd3 Rxd4+ 51. Kxd4 h3 52. e6 fxe6
53. Ke5 Kf7 54. Ke4 Bf6 55. Kf3 Bh4 56. Ke3 Nf6
57. Kf3 Nd7 58. Ke2 h2 59. Kd2 h1=Q 60. Ke3 Qd5
61. Ke2 Ne5 62. Ke3 Bg3 63. Ke2 Qd3# 0-1

4... Qb4+ was a big blunder by Turing, but remained unpunished by White (5. Bd2 instead of 5. c3 would have led to +4.4). At move 20, White was at a +3.0 evaluation but in a tactically complicated position – which was not understood by both sides. 24.e4 was a tactical oversight. This time Turing took the present and never gave back the -6.0 (and better) lead in evalution. With the newly promoted queen after 59... h1=Q, Black announced a mate in 4 against the naked white king.

[Round "6"]
[White "Turing Engine"]
[Black "Shannon Engine"]
[Result "1/2-1/2"]

[PlyCount "73"]
1. d4 d5 2. Nc3 e5 3. dxe5 d4 4. Nb5 Bb4+
5. c3 dxc3 6. Qxd8+ Kxd8 7. bxc3 Bc5 8. Be3 Bxe3
9. Rd1+ Bd7 10. fxe3 Kc8 11. c4 Be6 12. Rd4 Nc6
13. Re4 a6 14. Nc3 Nge7 15. Nf3 a5 16. Nd4 Kd7
17. Nxe6 Kxe6 18. Nb5 Kd7 19. g3 Nb4 20. Rd4+ Kc6
21. Bg2+ Kb6 22. Rd7 Nbc6 23. O-O Rhd8 24. Nxc7 Rxd7
25. Nxa8+ Ka7 26. Bh3 Rd8 27. Rxf7 Rd1+ 28. Kg2 Kxa8
29. Rxg7 Rd2 30. Rxh7 Rxe2+ 31. Kg1 Rxa2 32. Bg2 Rc2
33. Rh4 Rc1+ 34. Kf2 Rc2+ 35. Kg1 Rc1+ 36. Kf2 Rc2+
37. Kg1 1/2-1/2

After 10.fxe3 the white pawn structure is only a ruin. The new ChessTiger engine evaluates this by -1.0, meaning something like a full pawn minus – although White is one pawn up.

Game 6: Position after 10. fxe3

In the sequel both sides missed some good opportunities. At the end Black was almost three pawn units ahead, when the repetition came.

[Round "7"]
[White "Shannon Engine"]
[Black "Turing Engine"]

[Result "1/2-1/2"]
[PlyCount "74"]
1. Nf3 Nf6 2. c3 d5 3. Ne5 Qd6 4. d4 Nc6
5. Qa4 Nd7 6. Nxc6 bxc6 7. Bg5 g6 8. Nd2 Bg7
9. e3 Rb8 10. Bf4 e5 11. dxe5 Nxe5 12. b4 Ra8
13. Be2 h5 14. Rb1 Bf5 15. Rc1 O-O 16. Qa6 c5
17. h4 Rfe8 18. Qxd6 cxd6 19. Bb5 cxb4 20. Bxe5 Rxe5
21. cxb4 Rb8 22. a4 Re7 23. Ke2 Rb6 24. Rc6 Bd7
25. Rxb6 axb6 26. Bxd7 Rxd7 27. a5 bxa5 28. bxa5 Bc3
29. Rb1 Ra7 30. Rb8+ Kh7 31. Kd3 Bxa5 32. Nf3 Rc7
33. Ra8 Bc3 34. Ng5+ Kh6 35. Nf3 Kh7 36. Ng5+ Kh6
37. Nf3 Kh7 1/2-1/2

The game developed almost normally. Especially after the exchange of queens in move 18 the position looked like in a human game. The draw by repetition of position was justified.

[Round "8"]
[White "Turing Engine"]
[Black "Shannon Engine"]
[Result "1/2-1/2"]
[PlyCount "83"]
1. Nf3 Nf6 2. d4 d5 3. Nc3 Qd6 4. Qd3 Nc6
5. Be3 Bg4 6. O-O-O Bxf3 7. exf3 Qb4 8. Qb5 e6
9. Bd3 a6 10. Qxb4 Bxb4 11. h4 Bxc3 12. bxc3 Ke7
13. Kd2 Ne8 14. Rb1 Nd6 15. g4 e5 16. h5 h6
17. g5 hxg5 18. dxe5 Nxe5 19. Bxg5+ f6 20. Be3 a5
21. Ke2 a4 22. Rhg1 g5 23. hxg6 Rh3 24. g7 Rg8
25. f4 Nf3 26. Rg3 Rxg3 27. fxg3 Nh2 28. Rb4 Rxg7
29. Bf2 a3 30. Rb3 Rg8 31. f5 Kd7 32. Rxa3 Re8+
33. Kd2 Nf3+ 34. Kc1 Rh8 35. Kb2 Nd2 36. Ra4 N6c4+
37. Bxc4 Nxc4+ 38. Kb3 Nd2+ 39. Ka3 Nc4+ 40. Kb3 Nd2+
41. Ka3 Nc4+ 42. Kb3 1/2-1/2

A rather eventless draw after an early exchange of queens. In a game between masters Black would likely have won the endgame.

[Round "9"]
[White "Shannon Engine"]
[Black "Turing Engine"]
[Result "1/2-1/2"]
[PlyCount "79"]
1. c4 f5 2. e4 e6 3. Qh5+ g6 4. Qh3 fxe4
5. Qe3 d5 6. c5 Nc6 7. Bb5 Bd7 8. Bxc6 Bxc6
9. d4 exd3 10. Qxe6+ Qe7 11. Qxe7+ Bxe7 12. f3 Bxc5
13. Bf4 O-O-O 14. Kd2 Re8 15. Nc3 d4 16. Ne4 Bxe4
17. fxe4 Nf6 18. Kxd3 Rxe4 19. Ne2 Rd8 20. Rhf1 Re6
21. Bg5 Rdd6 22. a4 h5 23. g3 a5 24. Rab1 c6
25. Rbe1 Bb4 26. Rc1 c5 27. Rxf6 Rxf6 28. Bxf6 Rxf6
29. Nf4 Kd8 30. Nd5 Rf2 31. Nxb4 axb4 32. Rxc5 Rxh2
33. b3 Rh3 34. Rg5 Ke7 35. Rxg6 Kf7 36. Rg5 Kf6

37. Rg8 Kf7 38. Rg5 Kf6 39. Rg8 Kf7 40. Rg5 1/2-1/2

White (=Shannon) got an absolutely terrible start with a minus pawn and his queen on a march, with evaluation -2.0 after move 6.c5.

Game 9: Position after 6.c5

In the rook ending Black still had an advantage. But instead of finding the lever 37... h4 he allowed a draw by repetition.

[Round "10"]
[White "Turing Engine"]
[Black "Shannon Engine"]
[Result "0-1"]
[PlyCount "78"]
1. c4 f5 2. Nf3 e6 3. Nc3 Qf6 4. d4 Bb4
5. Bd2 Bxc3 6. bxc3 f4 7. Qa4 Nc6 8. O-O-O a6
9. h4 Qf5 10. d5 Ne5 11. Nxe5 Qxe5 12. dxe6 Nf6
13. exd7+ Bxd7 14. Qb3 Bc6 15. e3 Ke7 16. exf4 Qf5
17. Be3 Rad8 18. Qc2 Qxc2+ 19. Kxc2 Ba4+ 20. Kb2 Rxd1
21. Ka3 Bc2 22. g3 Be4 23. Bc5+ Kf7 24. f3 Bxf3
25. Rg1 b6 26. Bd4 c5 27. Be5 Ng4 28. h5 Ne3
29. h6 Nxf1 30. g4 Rhd8 31. Bxg7 Nd2 32. Rxd1 Bxd1
33. Kb2 Nxc4+ 34. Kb1 Ba4 35. a3 Bb3 36. Bd4 cxd4

37. g5 dxc3 38. g6+ Ke7 39. f5 Rd1# 0-1

Turing with White became victim of a horizon effect in move 18 which brought Shannon a 6-point advantage.

Game 10: Position before Turing's blunder 18.Qc2

Shannon took the opportunity with both hands and left White no chance at all. With 35... Bb3 Black announced a mate in 4. The sidestep 38... Ke7 looks more elegant than the standard hxg6.

**** End of the match ****

The match as a whole reminded me of the human World Championship between title holder Lasker and challenger Schlechter in 1911. It was set for 10 games, and Schlechter led by 5-4 after a win in round 5 and 8 more draws. Lasker needed at all cost a win in the final round – and got it after a clash of titans. Analogously, the Shannon engine was able to egalize against Turing also in round 10.

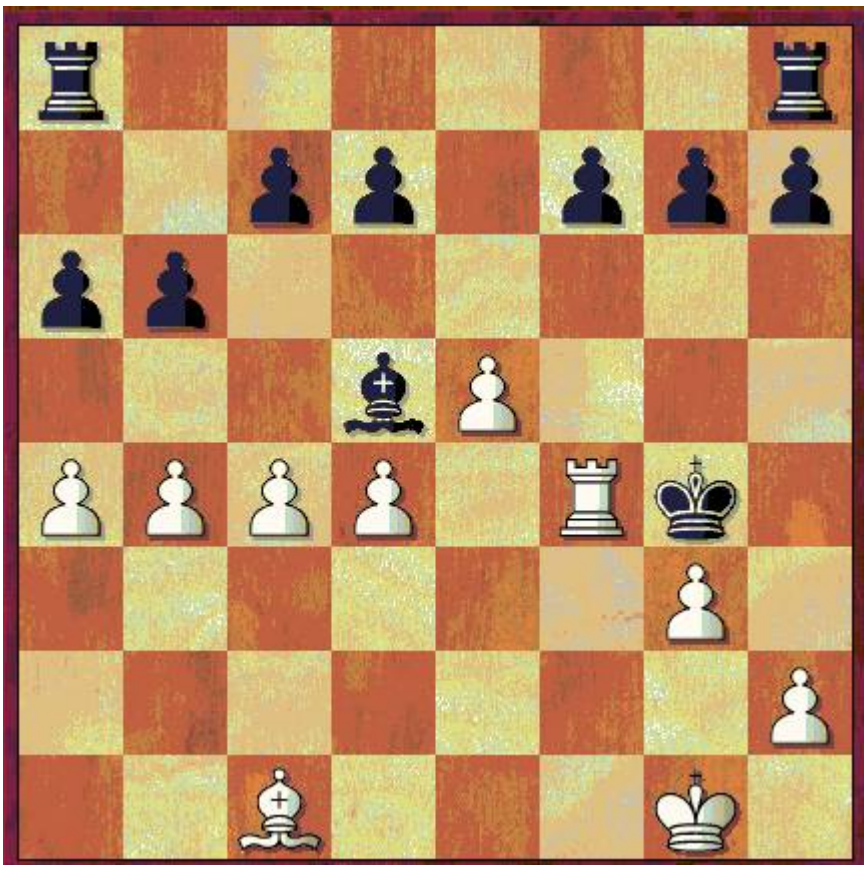
In a side test we found out that both engines are not able (at least not at 15 seconds thinking time per move) to mate with king plus rook versus king, and also not with king plus queen versus king. Typically they run, after some promising starting moves, earlier or later in a repetition of positions.

3. Shannon Engine and Turing Engine vs "Modern" Programs

For a comparison of two programs A and B one natural way is to have direct games between them like described above. Another way is to let them play against different programs C. We did this and got interesting findings. The most striking difference in the evaluation functions of Shannon and Turing is the following: In both programs, first of all the weighted sum of the white pieces s(W) and analogously the weighted sum s(B) for Black are computed. Now, for total evaluation Shannon takes the difference s(W) – s(B), where Turing looks at the ratio s(W)/s(B). Turing gives a good reason for his choice: when a player has an advantage he will prefer exchanges; when behind he will try to avoid them.

In games with handicap for the engine the Turing approach typically helps: being ahead by material the engine will prefer exchanges. This can be seen in games of the Turing engine versus Chess Tiger 15 (an engine which came to market in 2002), where the Tiger played without queen: Typically Turing reached clearly won endgames. Unfortunately in those endgames "always" a draw by threefold repetition of position occurred, leading to a draw. In contrast, Shannon's engine – against ChessTiger 15 with queen handicap – quickly lost almost all of its material advantage and got draws only because ChessTiger (without contempt factor) accepted repetition of positions when it was only still slightly behind. As examples we show one such game for each of the engines.

[Date "2012.04.14"]
[White "ChessTiger 15, without queen"]
[Black "Shannon Engine"]
[Result "1/2-1/2"]
[SetUp "1"]
[FEN "rnbqkbnr/pppppppp/8/8/8/8/PPPPPPPP/RNB1KBNR w KQkq - 0 1"]
[PlyCount "75"]
1. d4 e6 2. Nf3 Qf6 3. g3 Nc6 4. c3 Qf5
5. Bg2 Qc2 6. Nbd2 a6 7. O-O Be7 8. e4 Qd3
9. a4 Nh6 10. Ne1 Qe2 11. Bf3 Qxf1+ 12. Nxf1 Ng8
13. Nd3 Na5 14. Nd2 Nh6 15. b4 Nc6 16. Nc4 Ng8
17. Bg2 Nf6 18. e5 Nd5 19. Bxd5 exd5 20. Ne3 Nd8
21. Nxd5 Ne6 22. f4 b6 23. f5 Bb7 24. Nxe7 Kxe7
25. fxe6 Kxe6 26. c4 Kf5 27. Bb2 Be4 28. Rf1+ Kg5
29. Bc1+ Kh5 30. Nf4+ Kg4 31. Nd5 Bxd5 32. Rf4+ Kg5
33. Rf6+ Kh5 34. Rf5+ Kg4 35. Rf4+ Kg5 36. Rf6+ Kh5
37. Rf5+ Kg4 38. Rf4+ 1/2-1/2



Final position from ChessTiger vs Shannon. Instead of repeating the position, White might have captured the bishop on d5, yielding a promising position against such a weak opponent.

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[Date "2012.04.14"]
[White "Turing Engine"]
[Black "ChessTiger 15, without queen"]
[Result "1/2-1/2"]
[SetUp "1"]
[FEN "rnb1kbnr/pppppppp/8/8/8/8/PPPPPPPP/RNBQKBNR w KQkq - 0 1"]
[PlyCount "76"]
1. e3 Nf6 2. Nc3 d5 3. Nh3 e5 4. d4 e4
5. Be2 c6 6. a4 Bd6 7. O-O O-O 8. Bd2 Re8
9. a5 Na6 10. Bxa6 bxa6 11. f3 exf3 12. Qxf3 Bg4
13. Qf2 Rab8 14. Qh4 Bxh3 15. gxh3 Rxb2 16. Ra2 Rb4
17. Nxd5 Nxd5 18. Bxb4 Nxb4 19. Rb2 Bf8 20. Qh5 g6
21. Qe2 Nd5 22. Qxa6 Nxe3 23. Rfb1 Nf5 24. Rb8 Rxb8
25. Rxb8 Kg7 26. Rxf8 Kxf8 27. Qxc6 Nh4 28. Qc5+ Kg7
29. Qe5+ f6 30. Qe7+ Kg8 31. Kf2 a6 32. Qxf6 Nf5
33. Qe6+ Kf8 34. Qe5 Kf7 35. Qd5+ Kf6 36. Qe5+ Kf7
37. Qd5+ Kf6 38. Qe5+ Kf7
1/2-1/2
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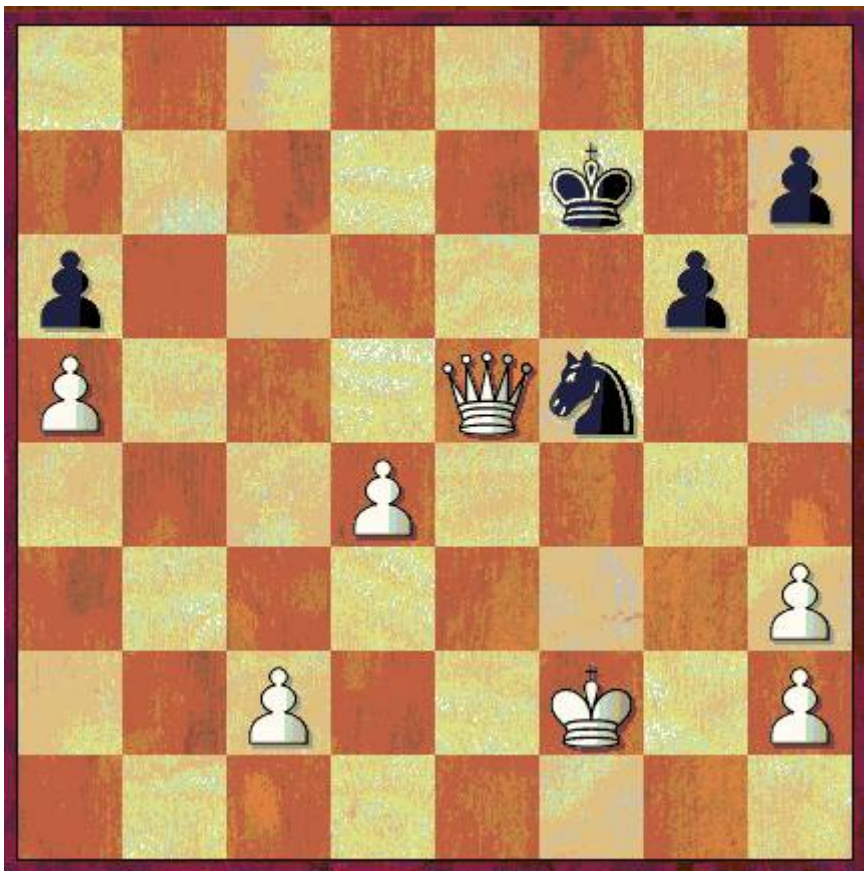


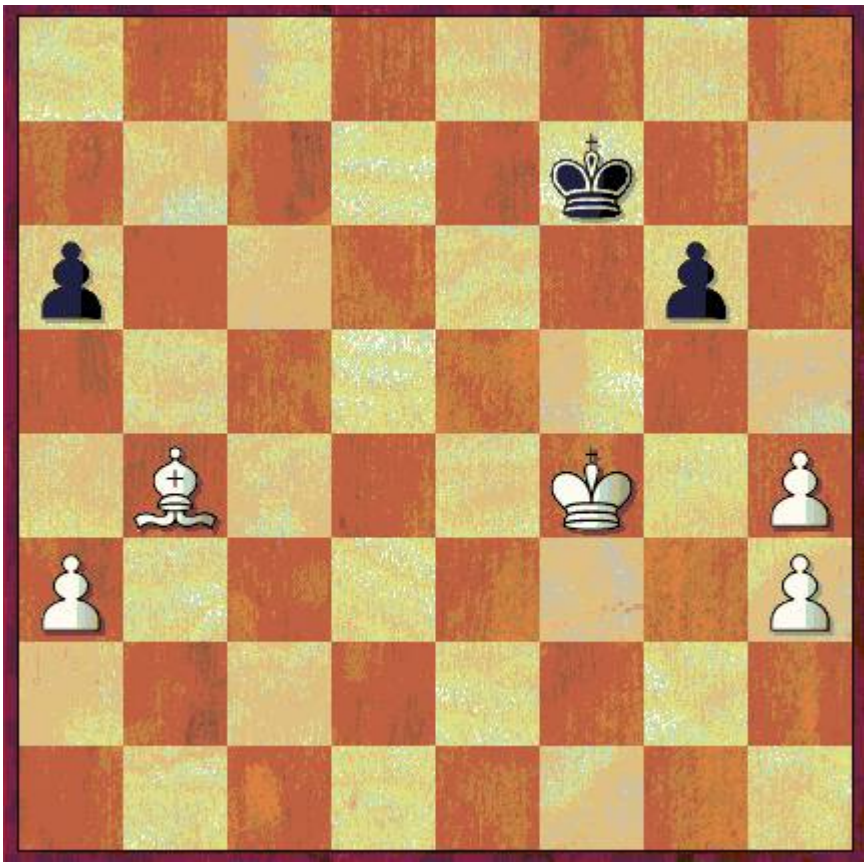
Final position from Turing vs ChessTiger. White is cleary ahead, but accepts the draw by repetition of moves.

* * * * *

The first chess computer that was sold commercially in bigger numbers in Germany, was in Fall 1978 the Chess Champion MK-1 (where the code had been stolen from the CompuChess project). It turns out that CC-MK1 is weaker than both the engines of Shannon and Turing. However, Shannon wins many games against CC-MK-1 by mating attacks in the early middle game, whereas Turing produces endgame positions with clear advantage in material, but draws by repetition of position in the outcome.

[Date "2012.04.15"]
[White "Turing Engine, 15 sec per move"]
[Black "CC MK1, Level 4"]
[Result "1/2-1/2"]
[PlyCount "93"]
1. e3 e5 2. Nc3 Nf6 3. Nh3 Bb4 4. Qf3 O-O
5. Bd3 d6 6. O-O Bxc3 7. bxc3 e4 8. Bxe4 Nxe4
9. Qxe4 d5 10. Qe5 f6 11. Qg3 Bxh3 12. gxh3 h6
13. Rb1 d4 14. Rxb7 Nd7 15. Qxc7 Qxc7 16. Rxc7 dxc3
17. Rxd7 cxd2 18. Bxd2 a6 19. Rd4 Rac8 20. Bb4 Rf7
21. c3 f5 22. f3 h5 23. e4 fxe4 24. f4 e3

25. Re4 e2 26. Rxe2 h4 27. Re5 Rf6 28. Rh5 Rg6+
29. Kf2 Rb6 30. Re1 g6 31. Rxh4 Rb7 32. Re7 Rxe7
33. Bxe7 Rxc3 34. a3 Kf7 35. Bb4 Rc4 36. Rg4 Kf6
37. Rg3 Rxf4+ 38. Rf3 Rxf3+ 39. Kxf3 Kf5 40. h4 Ke6
41. Kg4 Kf6 42. Kf4 Kf7 43. h3 Kf6 44. Kg4 Kf7
45. Kf4 Kf6 46. Kg4 Kf7 47. Kf4 1/2-1/2



Final position from Turing vs Chess Champion MK-1. White allows a draw by repetition of position, although being in a clearly won situation.

[Date "2012.04.15"]
[White "Shannon Engine, 15 sec per move"]
[Black "CC MK1, Level 4"]
[Result "1-0"]
[PlyCount "31"]
1. d4 d5 2. e4 dxe4 3. Bc4 Nf6 4. Bf4 e6
5. Bb5+ Ke7 6. a4 Ng8 7. Nc3 a6 8. Bc4 b6
9. Nxe4 Nd7 10. Qh5 Bb7 11. Ng5 Ne5 12. Bxe5 g6
13. Qh4 Nf6 14. Bxf6+ Kxf6 15. Nxe6+ Kf5 16. Qf4# 1-0

Position from Shannon vs Chess Champion MK-1. Black has only the choice between two hopeless moves – and will be mated directly.

4. Conclusions

still in meditation mode ...

References

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