

The TCEC16 Computer Chess Superfinal: a perspective

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After the thrills and spills of two consecutive STOCKFISH–LEELA matches, this season’s Superfinal pitted STOCKFISH against newcomer ALLIESTEIN. From a spectator perspective, any match between an AB and an NN machine is worth the admission fee as the clash of styles invariably produces spectacular chess. However, after seeing LEELA remain undefeated throughout Division P while defeating STOCKFISH in their mini-match (a typical LEELA ALPHAZERO-like squeeze with White against a French) it was also frustrating to miss out on another nailbiter!

The games between STOCKFISH and ALLIESTEIN in Division P indicated that ALLIESTEIN would struggle to keep the number of STOCKFISH wins down. First of all, STOCKFISH won a long game in 173 moves where a blocked and completely equal position turned sour for ALLIESTEIN as time went short, and then STOCKFISH demonstrated its own beautiful form of brutality with exceptionally powerful kingside attacks. By contrast, despite pressing hard in its White games, ALLIESTEIN scored its only victory when STOCKFISH suffered one of two crashes in a somewhat inferior position. It seemed likely that the tension of the previous two Sufis, where the result remained unclear until the final stages, was not going to be repeated, and indeed STOCKFISH scored a convincing 14-5 victory with 81 draws.

There were some exceptionally fine games from both sides, and some intriguing moments as openings book author Jeroen Noomen (who once again did a great job) selected a certain number of openings from the ALPHAZERO–STOCKFISH matches!

1 Game 3: ALLIESTEIN v0.5–dev_7b41f8c-n (3823) – STOCKFISH 19092522 (3892) [E98]

ALLIESTEIN opened the scoring in the third game with a fine strategical performance from a Mar Del Plata King’s Indian. It was interesting to see how ALLIESTEIN guided the game through various transformations into a very promising pawn structure without STOCKFISH realising how serious matters had become.

At Fig. 1a after move 19, despite the 0.00 evaluation from STOCKFISH, I would estimate that White has an extremely serious advantage. This type of King’s Indian structure with a blocked f5-e4 centre is only viable for Black if he has control of the d4-square (via a pawn on c5 rather than c7) and if White faces a struggle to open the queenside. Here White’s access to the d4 square (great square for a knight!) reinforces the value of the blockading square e3, while White’s a4-a5 break can be executed pretty much at will. By contrast, here is the classical example of a reasonable version of this structure from Bronstein–Petrosian, Candidates Tournament Amsterdam/Leeuwarden, r11, 16th April, 1956.

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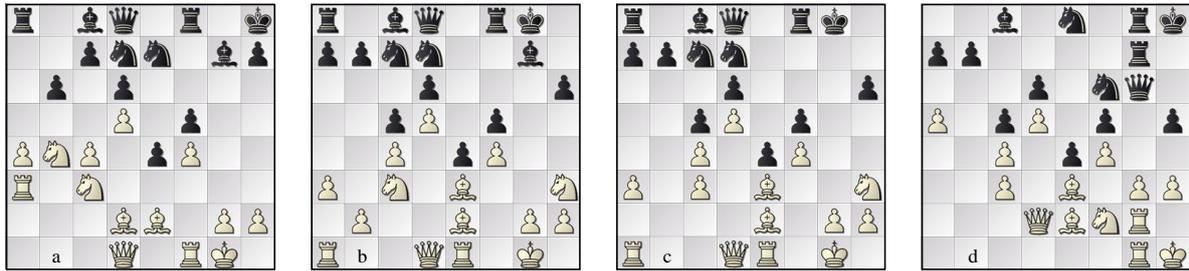


Fig. 1. (a) Game 3 position 20w; (b) Bronstein–Petrosian positions 17b, (c) 18b and (d) 30w.

Fig. 1b (Chessgames, 2019): **17. ... Bxc3 18. bxc3**, Fig. 1c. Black’s c5–pawn removes access to d4 from White’s pieces. The unexpected exchange on c3 ends any White hopes of breaking through on the queenside while shutting out the dark-squared bishop’s access to the a1–h8 diagonal. Magnus Carlsen repeated this same manoeuvre against Vincent Keymer at Grenke 2019.

18. ... Nf6 19. a4 Kh8 20. Nf2 Rg8 21. Kh1 Qe8 22. Rg1 Qg6 23. Qd2 Bd7 24. g3 Rae8 25. a5 Re7 26. Rab1 Bc8 27. Rg2 Reg7 28. Rbg1 Nce8 29. h3 h5, Fig. 1d, ½-½.

2 Games 5 and 6: ALLIESTEIN–STOCKFISH and STOCKFISH–ALLIESTEIN [B48]

STOCKFISH started to show its teeth in the Open Sicilian with a fantastic tactical defence as Black, see Figs. 2a and 2b. Then followed a convincing victory from the White side of the same opening. This featured a striking episode of play tweeted by Peter Heine Nielsen, Magnus Carlsen’s second.



Fig. 2. ALLIESTEIN–STOCKFISH (a) game 5, pos. 24w and (b) 26w;
(c) STOCKFISH–ALLIESTEIN game 6, pos. 20w and (d) ALPHAZERO–STOCKFISH, 2018 match, position 21w.

Fig. 2c: **20. Bd4 c5 21. Bg7**. This placement of the bishop on g7 is quite unusual in the context of the position: there is no immediate follow-up on the dark squares but the opponent’s king is simply completely restricted laying the basis for a future kingside attack (which certainly came later!). The only other example of this that came to mind was bizarrely enough from a game of the ALPHAZERO–STOCKFISH match, London, 2018. Fig. 2d: **21. Bg7**.

3 Game 14: STOCKFISH–ALLIESTEIN [C19]

The next notable game for me was the 14th game where, given free choice after the 7th move of a French Winawer, ALLIESTEIN repeated ALPHAZERO’s very interesting choice during its match against STOCKFISH, namely one of Bronstein’s unexplored ideas in the Poisoned Pawn, **12. ... Na6** instead of the almost exclusively played 12...Nbc6.

1. e4 e6 2. d4 d5 3. Nc3 Bb4 4. e5 c5 5. a3 Bxc3+ 6. bxc3 Ne7 7. Qg4 Qc7 8. Qxg7 Rg8 9. Qxh7 cxd4 10. Ne2 dxc3 11. f4 Bd7 12. Qd3 Na6, Fig. 3a.

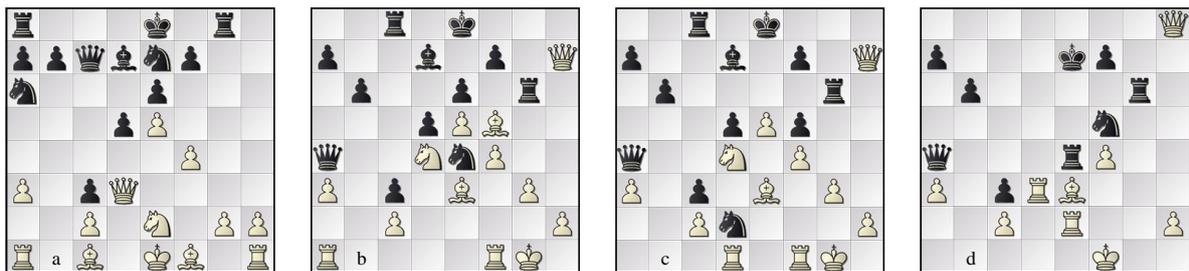


Fig. 3. Game 61, STOCKFISH–ALLIESTEIN game 14, positions (a) 13w, (b) 21b, (c) 23w and (d) 33b.

This STOCKFISH preferred **13. Nd4** to 13. g3 but the games proceeded in a similar fashion, including the manoeuvre of the knight to e4 and doubled f-pawns after a later ...Nf5, Bxf5, see Fig. 3b, and the ...Nd2 idea as in Fig. 3c – until, in the position of Fig. 3d, ALLIESTEIN surprisingly blundered with **33. ... Qc6**, allowing a neat but not too difficult tactic. 33. ... Rd6 was recommended by both LEELA and STOCKFISH and seems to hold the balance as Black is firmly entrenched on the light squares around White’s centre. **34. Bc5+ Nd6**. 34. ... bxc5 35. Qd8+ Ke6 36. Qe8+ wins. **35. Bxd6+ Rxd6 36. Rxd6 Kxd6 37. Qh6+ Re6 38. Qf8+ Kd5 39. Qxf7** 1–0.

Such ‘unnecessary’ losses were another indication that ALLIESTEIN was indeed going to struggle but the match remained great fun and the game-pair 25-26 was also intriguing.

4 Game 26: STOCKFISH–ALLIESTEIN [E16]

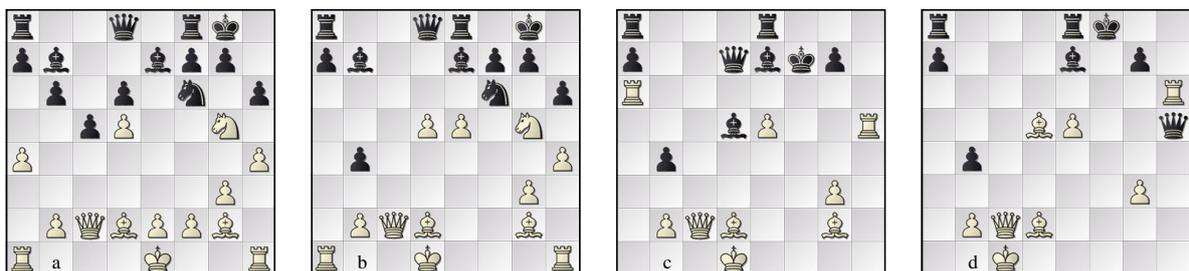


Fig 4. (a) ALPHAZERO–STOCKFISH position 15b; (b) STOCKFISH–ALLIESTEIN game 26, positions 20b, (c) 25b and (d) 28b.

1. d4 Nf6 2. c4 e6 3. Nf3 b6 4. g3 Bb7 5. Bg2 Bb4+ 6. Bd2 Be7 7. Nc3 0–0 8. Qc2 Na6 9. a3 c5 10. d5 exd5 11. Ng5 Nc7. This opening occurred in an ALPHAZERO–STOCKFISH game which we featured in *Game Changer* (Sadler and Regan, 2019, p230). That game is worth showing here.

12. Nxd5. ALPHAZERO in 2018 found an exceptionally strong plan based around a rook swing along the 3rd rank: 12. h4 h6 13. Nxd5 Ncxd5 14. cxd5 d6 15. a4, see Fig. 4a. One of those ALPHAZERO moves that took me some quality time to understand, particularly as none of my engines were impressed! Here STOCKFISH played the unnatural 15. ... Qd7 but I was confused at first by what White might have in mind after the natural 15. ... a6. Then I saw it, and when I asked ALPHAZERO later, I turned out to be right! ALPHAZERO's intention after this natural move was to play the powerful ...

16. Ra3 b5 17. g4 ALPHAZERO's way, though the immediate 17. Rf3 also looked very strong. 17. ... c4 18. Rf3 Re8 19. Nxf7 Kxf7 20. g5 Kg8 21. Qg6 was ALPHAZERO's main line with a huge 88.7% expected score!

The game continuation in 2018 was in fact 15. ... Qd7 16. Bc3 Rfe8 17. 0–0–0 Bd8 18. e4 Ng4 19. Bh3 hxc5 20. f3 f5 21. fxg4 fxg4 22. Bf1 gxh4 23. Bb5 Qf7 24. gxh4 Bf6 25. Rhf1 Rf8 26. Bxf6 gxf6 27. Rf4 which was very good for White, ALPHAZERO winning in 49 moves, 1–0.

There are many more amazing variations in *Game Changer* but I think you get the idea. To be honest, I felt this idea made Black's position more or less unplayable but neither ALLIESTEIN nor STOCKFISH played it. ALLIESTEIN played a more sedate version of ALPHAZERO's g4 idea and achieved relatively little. STOCKFISH played quite a traditional plan of pushing the central pawns - but it didn't lead to a traditional game! No way!

12. ... Ncxd5 13. cxd5 d6

The prior game 25, ALLIESTEIN–STOCKFISH, went 13. ... Re8 14. h4 d6 15. Bc3 h6 16. g4 Bc8 17. Bf3 b5 18. Qd3 a5 19. Nxf7 Kxf7 20. g5 g6 21. gxf6 Bxf6 22. h5 Bxc3+ 23. bxc3 Bf5 24. hxg6+ Bxg6 25. Qxb5 Qf6 26. Kf1 Qxc3 27. Re1 Qe5 28. Rxh6 Rh8 29. Qd7+ Kf6 30. Qh3 Kg7 31. Rxh8 Rxh8 32. Qg4 Kf6 ... drawn in 88 moves.

14. e4 b5 15. f4 h6 16. h4 b4 17. axb4 cxb4 18. e5 dxe5 19. fxe5 Re8 20. Kd1, Fig. 4b. That is STOCKFISH on the loose! ALLIESTEIN's defence looks very suspicious in principle - Black is setting up barriers on the light squares which are extremely porous - but the tactical refutation is magnificent!

20. ... hxg5 21. hxg5 Nh5 22. g6 Bxd5 23. Rxh5 Qd7 24. gxf7+ Kxf7 25. Ra6, Fig. 4c. Worth a few diagrams this game! Fantastic attacking vision using both rooks. ALLIESTEIN will have been rueing the sequence 16. ... b4 17. axb4 cxb4 which activated STOCKFISH's hitherto passive rook on a1.

25. ... Qg4+ 26. Kc1 Qxh5 27. Bxd5+ Kf8 28. Rh6, Fig. 4d. Child's play for STOCKFISH but extremely visual! **28. ... g6 29. Rxh5 Rec8 30. Rh8+ Kg7 31. Rxc8 Rxc8 32. Qxc8 Bg5 33. Qg8+ Kh6 34. Qh8# 1–0.**

ALLIESTEIN hit back in the next game with a smooth win that again demonstrated a superior evaluation of a static pawn structure and in fact, the engines continued trading wins until the very interesting game-pair 41-42.

5 Game 42: STOCKFISH–ALLIESTEIN [D70]

This featured one of ALPHAZERO's more astonishing opening discoveries.

1. d4 Nf6 2. c4 g6 3. f3 d5 4. cxd5 Nxd5 5. e4 Nb6 6. Nc3 Bg7 7. Be3 0–0 8. Qd2 Nc6 9. 0–0–0 f5 10.e5 f4, Fig. 5a, a fall-off-your-chair moment for me. I have studied the 3. f3 line in the Grünfeld very seriously but I never dreamt of this idea.

In fact, for quite some time I couldn't decide whether this was ALPHAZERO hating its position and going all-in or whether it really was a viable idea. The fact that Magnus Carlsen later punted it against Wesley So (albeit in a blitz game) shows that it has some value at least. ALLIESTEIN followed ALPHAZERO's recommendation - which had seemed the best to me - for a while before deviating with **18. Qg5+**. ALPHAZERO's 18. Qh6+ leads to a slightly unpleasant endgame for Black though one which I'm sure STOCKFISH would have had a decent go at holding! ALLIESTEIN's choice led to a wild game in which STOCKFISH miraculously kept itself afloat!

11. Bxf4 Nb4. The prior game 41, ALLIESTEIN-STOCKFISH, went 11. ... Be6 12. h4 Nb4, transposing back into ALPHAZERO's main line. 11. ... Nb4 and 11. ... Be6 were nearly equivalent moves for ALPHAZERO. 13. h5 c5 14. hxg6 Qc7 15. Bh6 cxd4 16. gxh7+ Kh8 17. Bxg7+ Kxg7, see Fig. 5b. 18. Qg5+ Kh8 19. Rxd4 Nxa2+ 20. Kd2 Rf5 21. Qh6 Rxe5 22. f4 Nc4+ 23. Bxc4 Qb6 24. Nce2 Qa5+ 25. Nc3 Qb6 26. fxe5 Qxd4+ 27. Ke1 Nxc3 28. Bxe6 Ne4 29. Qf4 Rd8 30. Bd7 Qb4+ 31. Ke2 Qxb2+ 32. Kf3 Nf2 33. Rh5 Nd3 34. Qe3 Rxd7 35. Ne2 Rd8 ... drawn in 167 moves.

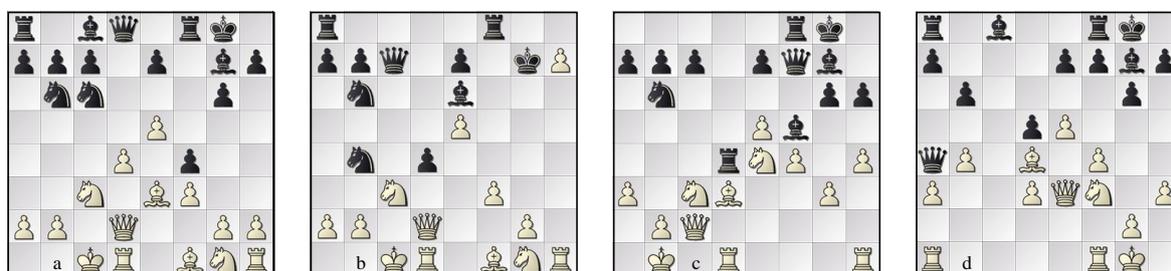


Fig. 5. (a) STOCKFISH-ALLIESTEIN game 42 position 11w; (b) ALLIESTEIN-STOCKFISH game 41 position 18w; (c) STOCKFISH-ALLIESTEIN game 42, position 23b; (d) ALLIESTEIN-STOCKFISH game 75, position 18b.

12. a3 Nc6 13. g3. A major idea for White which I also analysed quite a bit. STOCKFISH's earlier (natural) choice against ALPHAZERO led to an outburst of counterplay based around the weakening of the queenside provoked by the manoeuvre ... Nb4-c6.

STOCKFISH 8-ALPHAZERO, London UK, 2018, had gone 13. Nge2 Na5 14. Kb1 Nbc4 15. Qc1 b5 16. Ne4 Rb8 17. b4 Nc6 18. N2c3 Nxa3+ 19. Qxa3 Rxf4 20. Bxb5 Nxb4 21. Qxb4 Kh8 22. Kc2 a6 23. Ra1 axb5 ... drawn in 46 moves.

13. ... Bf5 14. Ne4 Qd5 15. Ne2 Rad8 16. Qc2 h6 17. h4 Qa2 18. N2c3 Qf7 19. Be3 Na5 20. Bd3 Nb3+ 21. Kb1 Nxd4 22. Bxd4 Rxd4 23. f4, Fig. 5c. Although Black has regained the sacrificed pawn, the restricted position of the bishop on g7 gives Black a long-term headache and STOCKFISH exploited this advantage convincingly, winning in 64 moves.

Somehow, after this, the match seemed to run away from ALLIESTEIN as STOCKFISH scored a number of wins without response including a fine **Bxh7+** sacrifice, move 23 of game 64, culminating in doubled rooks on the 8th rank tying down Black's (extra) piece down completely.

6 Game 75: ALLIESTEIN-STOCKFISH

Game 75 was notable for me as ALPHAZERO also scored many wins in this type of pawn structure and piece configuration (also often arising from Caro-Kanns or French Defences). Fig. 5d: **18. ... Be6.**

This structure with B+N vs 2Bs, a kingside space advantage and an open file that is hard for Black to exploit in any useful way is one that STOCKFISH also drifted into against ALPHAZERO. ALLIESTEIN also exploits the advantage in typical fashion: a squeeze on the kingside (including the typical pawn on h6, restricting the opponent's king movement while pinning the black h7-pawn as a future endgame weakness) followed by invasion on the file on the opposite side of the board that Black thought it had for itself!

19. g4 a5 20. Rfb1 Bd7 21. Kf2 Rfc8 22. Kg3 e6 23. h4 axb4 24. Rxb4 Qa5 25. h5 b5 26. Rb2 Qd8 27. Rh2 g5 28. fxg5 Ra4 29. Rhh1 Be8 30. Rhc1 Raa8 31. Bc5 Rxc5 32. Qxc5 Bf8 33. Qc7 Be7 34. Qxd8 Bxd8 35. h6 Kf8 36. Rcb1 Ba5 37. Rb3 Bd7 38. g6 hxg6 39. g5 Kg8 40. Kh4 d4 41. Nxd4 Bc7 42. Nf3 Ra4+ 43. Kg3 Ra8 44. Rc1 Ba5 45. d4 Rd8 46. Rd3 Bc8 47. Rb3 Ba6 1–0.

The final ended with a trade of wins in the Dragon with STOCKFISH's amazing calculating prowess coming to the fore in the final game as ALLIESTEIN sought to advance its kingside pawns: the geometry of the final assault is quite dazzling! Look at that queen go!

7 Game 100: STOCKFISH–ALLIESTEIN [B35]

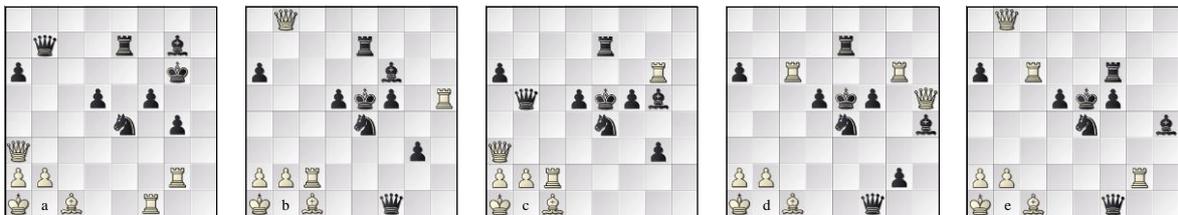


Fig. 6. STOCKFISH-ALLIESTEIN game 100, positions (a) 44w, (b) 51b, (c) 55b, (d) 58b and (e) 61b.

Fig. 6a: **44. Qh3 Qb5 45. Rh1 Kf6 46. Qh7 Ke6 47. Qg6+ Bf6 48. Rh5 Qf1 49. Qg8+ Ke5 50. Rc2 g3 51. Qb8+**, Fig. 6b.

51. ... Kd4 52. Rh6 Bg5 53. Qb4+ Ke5 54. Rg6 Qb5 55. Qa3, Fig. 6c.

55. ... Bh4 56. Rcc6 g2 57. Qf3 Qf1 58. Qh5, Fig. 6d.

58. ... Re8 59. Rxx2 Re6 60. Qh8+ Rf6 61. Qb8+, Fig. 6e.

61. ... Kd4 62. Qb4+ Ke5 63. Qe7+ 1–0.

A deserved victory for STOCKFISH and a very entertaining match – congratulations to both sides! And as always, a special round of applause for the TCEC for organising chess events of such astonishingly high quality. Let's hope for many more in the future!

REFERENCES

Chessgames (2019). <https://tinyurl.com/tcec-ms01>. Bronstein–Petrosian, 16th April, 1956.

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