

Computer Shogi Programs Versus Human Professional Players through 2013

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Top computer shogi programs reached professional 4-dan level at the 20th World Computer Shogi Championship. Usually, programmers of computer shogi are amateur shogi players and usually lack a deep understanding of precisely why a program is strong. Therefore, watching and studying many games between computer shogi programs and professional shogi players is important for programmers to gain a better understanding. Explanations from commentators are also very helpful in this regard.

The second Den-O-Sen (five-game match between computer shogi programs and human professional players) was organized by Nihon Shogi Renmei (the Japan Shogi Association, the JSA) and Dwango Co., Ltd., in March and April, 2013. Computer shogi programs won the match with three wins, one loss, and one draw. This article discusses how computer shogi programs performed at the match at the second Den-O-Sen.

This experience was a valuable chance to better understand computer shogi.

1. The first Den-O-Sen and past matches

The first match between a female professional player and a computer shogi program was an exhibition match at the 2001 MSO Japan on July 29, 2001. There was a match between two invited programs, IS-Shogi and Gekisashi. The winner of the match would challenge Yamato Takahashi, female professional 3-dan. IS won both games (playing first and second) and became the challenger. The total time spent was 15 minutes plus 60 seconds byoyomi for both players. Ms. Takahashi played first and won the match. Ms. Takahashi said after the game, "IS-Shogi is about 1-dan in the opening, 4 or 5 dan in the middle game, and 3 or 4 dan in the

endgame. It is not 1 or 2 dan but 3 or 4 dan throughout the game".

On September 19, 2005, Hokkoku Shimbun sponsored Takanori Hashimoto 8-dan vs TACOS. Eventually, Hashimoto 8-dan won the match but TACOS had the advantage in the middle game. After this match, on October 14, 2005, the JSA prohibited the professional players from playing against computer programs in front of an audience.

On March 21, 2007, there was a match between Akira Watanabe Ryu-O and Bonanza. This was the first official match after Hashimoto's game. Daiwa Securities sponsored the match. It was a very close game. Watanabe Ryu-O won the match. Watanabe Ryo-O said recently that he was lucky because he was in a critical position where a human professional player might find a

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Table 1.1. Matches between Human Professional Players and Computer Shogi (Without Handicap)

Date	Event	Sponsor	Professional Player	Computer Shogi	Winner(draw)	Total Time Spent	Byoyomi
2001.7.29	MSO2001	MSO	Yamato Takahashi female 3-dan	IS Shogi	Takahashi female 3-dan	15 min.	60 sec.
2005.9.19	Hokkoku Osho Hai Special Match	Hokkoku Shimbun	Takanori Hashimoto 8-dan	TACOS	Hashimoto 8-dan		
2005	Special Match vs Computer Shogi	Kyodo Tsushin	Shinobu Iwane female 2-dan	Gekisashi	Gekisashi	30 min.	60 sec.
2007.3.21	Daiwa Shoken Hai Special Match	Daiwa Securities	Akira Watanabe Ryo	Bonanza	Watanabe Ryo	2 hours	60 sec.
2010.10.11	Challenge Match by Computer Shogi	Komazakura	Ichiyo Shimizu female 6-dan	Akara 2010	Akara	3 hours	60 sec.
2011.12.21	Den-O-Sen Practice Match	Dwango Co. Ltd.	Kunio Yonenaga Eisei Kisei	Bonkras	Bonkras	15 min.	60 sec.
2012.1.14	First Shogi Den-O-sen	JSA, Dwango Co. Ltd., Cho-Koron-Shinsha Inc.	Kunio Yonenaga Eisei Kisei	Bonkras	Bonkras	3 hours	60 sec.
2013.3.23	Second Shogi Den-O-Sen	Dwango Co. Ltd., JSA	Koru Abe 4-dan	Shueso	Abe 4-dan	4 hours	60 sec.
2013.3.30			Shin'ichi Sato 4-dan	ponanza	ponanza		
2013.4.6			Kohei Funae 5-dan	Tsutsukana	Tsutsukana		
2013.4.13			Yasuaki Tsukada 9-dan	Puella alpha	draw		
2013.4.20			Hiroyuki Miura 9-dan	GPS Shogi	GPS		

winning move relatively easily but the computer shogi program could not.

On October 11, 2010 there was a match between the computer shogi system “Akara2010” and the female Osho Ichiyo Shimizu (who has the title on the day of the match). This match was sponsored by Komazakura (JSA), IPSJ and the University of Tokyo. The total time spent was three hours plus 60 seconds byoyomi for both players. Akara2010 won the match.

The first Den-O-Sen was held on January 14, 2012. This was a match between a retired professional, the late Kunio Yonenaga, and a computer program Bonkras (first player). Bonkras was the winner of the 21st WCSC. This match was sponsored by the JSA, Dwango Co., Ltd., and Chuokoron-Shinsha, Inc. The total time spent was three hours plus 60

seconds byoyomi for both players. Bonkras won the match. (Table 1.1). 1)2)3)4)5)6)7)

2. The second Den-O-Sen

The second Den-O-Sen was a five-game match and was held on the Saturdays of March 23 (Koru Abe (4-dan, won) vs. Shuso (second player)), March 30 (Shin'ichi Sato (4-dan) vs. ponanza (first player, won)), April 6 (Kohei Funae (5-dan) vs. Tsutsukana (second player, won)), April 13 (Yasuaki Tsukada (9-dan) vs. Puella alpha (the successor of Bonkras, first player), drawn as a result of Jishogi), and April 20 (Hiroyuki Miura (9-dan) vs. GPS (second player, won)), 2013. The present author predicted that human players could win the match by 4 wins and 1 loss, but the prediction was wrong. The five computer programs were first through fifth at the 22nd WCSC.



Fig.2.1 The first game of the second Den-O-Sen Akira Takeuchi (Shueso, left) and Koru Abe 4-dan

(c) Japan Shogi Association



Fig.2.2 The fifth game of the second Den-O-Sen Tomoyuki Kaneko (GPS Shogi, over the board) and Hiroyuki Miura 9-dan

(C) Japan Shogi Association

This match was sponsored by Dwango Co., Ltd., and the JSA. The total time spent for each game was four hours plus 60 seconds byoyomi for both players.

It was a major surprise that A-class professional Miura was defeated. The present author does not consider computer software to yet be superior to the skill of human professionals, but believes it now to be very close in strength to that of professionals. 8)9)10)11)

3. The third Den-O-Sen and the future

After the 2nd Den-O-Sen, the 23rd WCSC was held. Puella alpha did not enter, but other programs that participated in the 2nd Den-O-Sen were second (ponanza), third (GPS Shogi), 6th (Tsutsukana), and 7th (Shueso). Bonanza was the winner, Gekisashi was fourth and YSS was eighth. A newcomer NineDayFever was fifth (**Table 3.1**).

The third Den-O-Sen will be a five-game match and is planned for March and April, 2014. The detailed game rules have not yet been published.

Table 3.1. The Results of the Final of the 23rd World Computer Shogi Championship

No.	Program Name	1	2	3	4	5	6	7	Pt	SB	MD
1	Bonanza	5+	8+	6+	2-	7-	4+	3+	5.0	16.0	10.0
2	ponanza	8+	7+	5-	1+	6+	3-	4+	5.0	15.0	9.0
3	GPS Shogi	7+	6+	8+	5+	4-	2+	1-	5.0	14.0	8.0
4	Gekisashi	6+	5-	7+	8+	3+	1-	2-	4.0	11.0	5.0
5	NineDayFever	1-	4+	2+	3-	8+	7-	6-	3.0	10.0	4.0
6	Tsutsukana	4-	3-	1-	7+	2-	8+	5+	3.0	6.0	2.0
7	Shuso	3-	2-	4-	6-	1+	5+	8-	2.0	8.0	0.0
8	YSS	2-	1-	3-	4-	5-	6-	7+	1.0	2.0	0.0

It is not wrong to say that computer shogi programs are now as strong as ordinary human professional players. The way that computer shogi programs may help human professionals has become the most important point. To verify Joseki or a middle game database will be one of the main points.

Watching the exhibition match at the 2008 WCSC, Daisuke Nakagawa 8-dan won three games (official games, including against Watanabe Ryu-O) using Tanase-shogi moves (with a couple of modifications). Toshiyuki Moriuchi Meijin was familiar with ponanza's moves and used this knowledge at the recent Meijin match, winning the game against Yoshiharu Habu, the challenger. Nobuyuki Yashiki 9-dan used GPS's moves in the second Den-O-Sen against Hiroyuki Miura 9-dan, but Miura 9-dan won the match because he had studied and modified the same moves.

4. Conclusion

The human chess game is still active, although computer chess programs are becoming stronger than the strongest human player. The relation between the human shogi player and the computer shogi program will be on a par with the relation between human chess players and computer chess programs in five years. There are further problems, however. The ways of winning shogi, for example, still remain.

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