

THE 2010 TAAI COMPUTER-GAME TOURNAMENTS

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As part of the 2010 conference on Technologies and Applications of Artificial Intelligence (TAAI 2010), the TAAI computer game tournaments were held in National Chao Tung University, Hsinchu, Taiwan, from November 18th to 20th, 2010. In this event, there were 9 game tournaments including Chinese Dark Chess, Connect6, Go 9x9, Go 13x13, Go 19x19, Light Up, Nonogram, Nurikabe, and Shogi 5x5. Totally, 47 teams participated in the tournaments. The results are shown in Table 1.

Game	Rank	Program Name	Author(s)	Affiliation(s)
Chinese Dark Chess	1	FLIPPER	Bo-Nian Chen, Tsan-Sheng Hsu	IIS, Sinica, Taiwan
	2	DARK CHESS BETA	Cheng-Hsiao Hsieh	National Taiwan Normal University (NTNU), Taiwan.
	3	LOL	Meng-Tsung Tsai, Hung-Jui Chang, Tsan-sheng Hsu	Sinica, Taiwan
Connect6	1	SIMC	Ping-Hung Lin, Hsin-Ti Tsai, Hao-Hua Kang, I-Chen Wu	National Chiao Tung Univerty (NCTU), Taiwan.
	2	ANT	Yu-Chen Lai, Chih-Hung Chen	NTNU, Taiwan.
	3	KAVALAN	Jung-Kuei Yang, Shi-Jim Yen	National Dong Hwa University (NDHU), Taiwan
Go 9x9	1	MOGOTW	Olivier Teytaud	TAO, INRIA, France
	2	HAPPYGO	Chun-Yi Chen, Ching-Yuan Yang, Cun-Dao Zuo, I-Chen Wu	NCTU, Taiwan
	3	COLDMILK	Cheng-Wei Chou, Shi-Jim Yen	NDHU, Taiwan
Go 13x13	1	MOGOTW	Olivier Teytaud	TAO, INRIA, France
	2	GO INTELLECT	Keh-Hsun Chen	UNC Charlotte, USA
	3	COLDMILK	Cheng-Wei Chou, Shi-Jim Yen	NDHU, Taiwan
Go 19x19	1	MOGOTW	Olivier Teytaud	TAO, INRIA, France
	2	DEEPZEN	Yoji Ojima and Hideki Kato	The University of Tokyo, Japan
	3	COLDMILK	Cheng-Wei Chou, Shi-Jim Yen	NDHU, Taiwan
Light up	1	HAPPYLIGHTUP	Hao-Hua Kang	NCTU, Taiwan
	2	MARKX	Yi-Jen Chen	NCTU, Taiwan
	3	LIGHTUPCLOUD	Hao-Yun Liu	NCTU, Taiwan
Nonogram	1	HAPPYNONO	Hung-Hsuan Lin	NCTU, Taiwan
	2	NONOFROG	Ching-Hua Kuo	NCTU, Taiwan
	3	NONOLALA	Kan-Yueh Chen	NCTU, Taiwan
Nurikabe	1	HAPPYNURI	Der-Johng Sun, I-Chen Wu	NCTU, Taiwan
	2	JUIUKABE	Yung-Chou Chen, Shi-Jim Yen, Hsueh-Cheng Lai	NDHU, Taiwan
Shogi 5x5	1	CLAIR 128	Takuya Obata, Takeshi Ito	University of Electro-Communications, Japan
	2	GOGO	Yuu Chau, Yoshiyuki Kotani	Tokyo University of Agriculture and Technology, Japan
	3	EVG	Jr-Chang Chen, Shun-Chin Hsu	Chuang Yuan Christian Univ., and Chang Jung Christian Univ., Taiwan

Table 1: The final standings of all games, each including the top three only, if existing.

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From Table 1, we see that (1) the team from the National Chiao Tung University (NCTU), Taiwan, won four gold medals, (2) the team from TAO, INRIA, France, won three gold medals, (3) the team from the University of Electro-Communications, Japan, won one gold medal, and (4) the team from IIS, Sinica, Taiwan, won one gold medal. The Chinese-Chess tournament was separately held as 2010 World Computer Chinese-Chess Championship (Yen, Yang, and Wu, 2011) and was won by INTELLA, China. The three Go tournaments are reported separately (Yen *et al.*, 2011). Thus, this report comments on the remaining six game tournaments.

Chinese Dark Chess (CDC) is a game played by many Taiwanese and Chinese citizens (Chen, Shen, and Hsu, 2010). In the CDC tournament, four teams participated, and FLIPPER won the gold. The winning sequence is quite different from that in the 15th Computer Olympiad in Kanazawa, Japan. In Kanazawa, FLIPPER only landed at the 4th place, while MODARK won the gold. However, MODARK did not enter the top three in TAAI 2010. The fluctuation of winning sequences is due to the uncertainty of the initial position. Thus, this result shows that more games are needed in the CDC tournament.

Connect6 is a kind of six-in-a-row game that was introduced by Wu *et al.* (Wu and Huang, 2005; Wu, Huang, and Chang, 2006), and has become one of the games in the Computer Olympiad since 2006. In the Connect6 tournament, three teams participated and SIMC won the gold. ANT and KAVALON achieved the second and third place respectively, while they landed at the fourth and the second place respectively in Kanazawa. SIMC, a program modified from NCTU6, tried to use Monte-Carlo tree search, instead of the traditional alpha-beta search, while still keeping the threat-space search based on the relevance-zone-oriented (RZOP) search (Wu and Lin, 2010). SIMC was relatively weak when compared with NCTU6 in the internal experiments. However, SIMC still won all the four games against ANT and KAVALON in this tournament. One of the games against ANT is shown in Figure 1. In this game, SIMC played as White, while ANT played as Black. Move 7 is a losing move. SIMC successfully found a winning move at 8. According to the analysis by SIMC, the suggested move for 7 is at A and B, which could defend the position properly. Another suggested move is at the original upper 7 and C, since the move can make a live three and force the opponent to use one piece to defend.

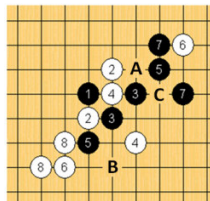


Figure 1: SIMC (White) vs. ANT (Black).

Shogi is also known as Japanese Chess, while Shogi 5x5 (Grimbergen and Matsubara, 2010) is a mini-version of Shogi. In the Shogi 5x5 tournament, seven teams participated and three of them are from Japan. CLAIR 128 won the gold medal, GOGO won the silver medal, and EVG achieved the bronze medal. The first two teams were from Japan, and the third was from Taiwan.

The remaining three games are puzzle games, Nurikabe, Nonogram, and Light Up (Ueda and Nagao, 1996; Kendall, Parkes, and Spoerer, 2008), which were also played in 15th Computer Olympiad in Kanazawa, Japan. The tournament rules (Sun, Wu, and Yen, 2010) were the same, briefly described as follows. For each pair of teams, one needs to provide the other with 100 puzzles to solve within 30 minutes. The one who solved more puzzles wins, but if both solve the same number of puzzles, the one who takes less time wins.

In the Nurikabe tournament, only two teams participated, from NCTU and National Dong Hwa University (NDHU) respectively, and HAPPYNURI won the gold. HAPPYNURI also participated in the tournament in Kanazawa, and also won the gold (Sun, Wu, and Yen, 2010).

In the Light Up tournament, eight teams from NCTU and one from NDHU participated. HAPPYLIGHTUP, MARKX, and LIGHTUPCLOUD all from NCTU won the gold, silver, and bronze medals respectively. The three programs did not attend the tournament in Kanazawa.

In the Nonogram tournament, 11 teams from NCTU and one from NDHU participated. HAPPYNONO, NONOFROG, and NONOLALA all from NCTU won the gold, silver, and bronze medals respectively. They did not attend the tournament in Kanazawa either. For one of the hardest puzzles provided by HAPPYNONO shown in Figure 2, HAPPYNONO itself also needed to take about 10 minutes to solve it. From the figure, this puzzle includes a large number of hints with number one. According to our analysis, puzzles containing more small hint numbers tend to be more difficult to solve.

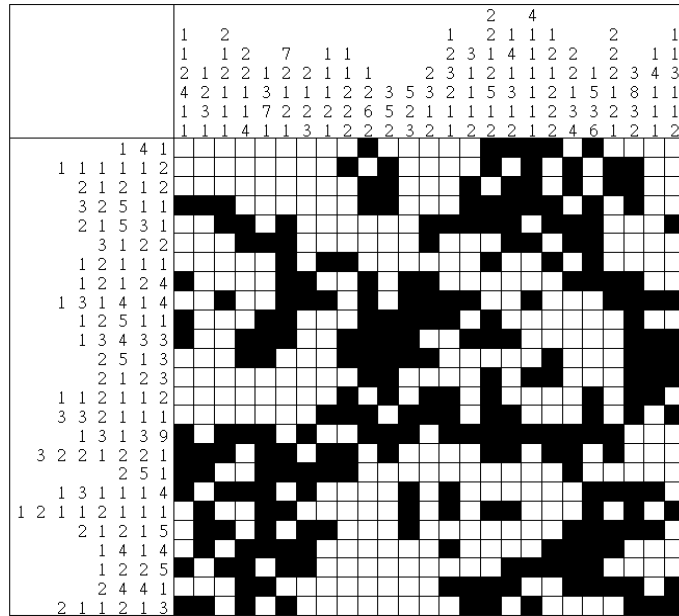


Figure 2: One of the hardest Nonogram puzzles provided by HAPPYNONO.



F.l.t.r.: Der-Johng Sun (HAPPYNURI), Shi-Yuan Chiu (JUIUKABE), Hung-Hsuan Lin (HAPPYNONO), Ching-Hua Kuo (NONOFROG), Kan-Yuen Chen (NONOLALA), Shi-Jim Yen, Hao-Hua Kang (HAPPYLIGHTUP), Yi-Shan Lin (MARKX), and Hao-Yun Liu (LIGHTUPCLOUD).



F.i.t.r.: Takuya Obata (CLAIR 128), Yoshiyuki Kotani (GOGO), Shun-Chin Hsu (EVG), Hsin-Ti Tsai (SIMC), Chih-Hung Chen (ANT), and Jung-Kuei Yang (KAVALAN)

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