The 2021 Computer Olympiad

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Abstract. The 24th Computer Olympiad was held online during August/September 2021. With 60 participants competing in 22 events, the event was a success. This raises the question as to whether the ICGA and its members are best served by having future Olympiads online or returning to the in-person format.

1. INTRODUCTION

The pandemic forced many events to move online, and the Computer Olympiad was no exception. The 23rd Olympiad (2020) was held online, forcing the ICGA to rethink the event format and rules. Building on that success, the 24th Olympiad was also online during August and September 2021. This report summarizes the observations and results from this event.

2. PREPARATION

With the pandemic still a global concern, there was only one choice if the ICGA was to hold an Olympiad in 2021: it had to be online. Moving the 2020 event online involved considerable work, as the organizers (the three authors of this paper) had to create a new format for the competitions and a new set of rules. The 2020 event ran smoothly and was almost problem free.

The 2021 Olympiad had an almost identical format to the previous event. Some minor rule changes were made to accommodate a few unforeseen situations. As well, the event schedule was modified to prevent the annoying problem of having to collect some of the registration fees after the events were concluded. For 2021, all registration fees were paid in advance, with only one exception. Other than that, because of the sportsmanship and cooperation of the participants, the event was trouble free. Information on the Olympiad schedule (2021 Computer Olympiad, 2021) and rules (Computer Olympiad Rules, 2021) are available.

Each event was self-organized. For each event, the participants were asked to agree on the following competition details:

- Format, with a round-robin being the standard.
- Number of games played between competitors.

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- Time controls (most games had a standard setting).
- Playoffs. Some events agreed on the final round-robin standings serving for decisions on the medals. Other competitions had 1, 2 or 4-game matches to determine the medals.

The original schedule had 8 days to complete all the games (August 23 to August 30). Some events went beyond that limit to accommodate any special needs of the participants.

The 2021 Olympiad saw the debut of a new competition: Sylver Coinage (2022). This game was created by the brilliant mathematician John Conway, who sadly passed away in 2020 due to COVID-19. Conway has many claims to fame but is perhaps best known for his Game of Life. Thank you to Gilad Moskowitz for introducing the game to the Olympiad.

3. RESULTS

In 2021, we had 22 competitions totalling 60 registrants. In terms of the number of events, it tied for the second largest in Olympiad history, behind 24 in the 22nd Olympiad (Macau, 2019) (Schaeffer, 2021). As to the number of participants, this was tied for the 10th largest in Olympiad history. The record is 108 in the 15th Olympiad (Kanazawa, Japan, 2010).

Note that a further 10 competitions were not held because there was only a single entrant. Hopefully these games will reappear in the 2022 Olympiad.

Compared to our first online Olympiad (November/December 2020 (Iida et al., 2021)), the number of competitions went up by one, but the number of participating programs dropped by five.

The ICGA congratulations all the Gold, Silver, and Bronze Medal winners, and thanks all the participants of the 24th Computer Olympiad. There were many interesting results, but one accomplishment stands out for special recognition. Quentin Cohen-Solal and Tristan Cazenave seem to be on a mission to win every competition. This year they entered 16, winning the Gold Medal in 11. That's going to be a difficult record to beat! Congratulations Quentin and Tristan.

The Appendix includes the results from all 22 Olympiad competitions.

4. PERSPECTIVES

The move to online raises two critical issues that the ICGA membership needs to resolve: a) online, in-person, or a hybrid Olympiad; and b) increasing the number of entries.

Post the pandemic, should the Olympiad return to its traditional in-person format? The cost of travelling to an Olympiad has been discussed in the past as being a significant barrier to participation. The online format was seen as a way for increasing the number of participating programs. However, the data does not support this. The historical record for the Olympiads shows 2020 and 2021 to be typical years in terms of entries (Schaeffer, 2021).

From the organizational point of view, an online Olympiad is much easier to organize (and less costly) than an in-person event. There is no need to deal with finding a venue, renting space, renting computers, obtaining Internet access, and so on. Essentially the move online comes without any significant financial costs for the organizers and the participants. Of course, an online Olympiad loses the most important aspect of in-person events – the ability to interact with your colleagues in person. We can

debate the quality of in-person versus online interactions, but it appears that for most Olympiad programmers online is less appealing for having casual discussions of games and AI.

How do we increase the number of Olympiad entries? Being online allows the event to easily handle more entries without incurring additional costs (which is not true for the in-person events). The Olympiad is advertised on the ICGA web site (low traffic), through several mailing lists (probably low impact), and from various mailouts (mostly to past participants). None of these methods seems to be reaching a new audience. Globally, game programming is a popular activity, but we have been unable to reach more game-AI programming aficionados.

Your thoughts on these issues are most welcome. Please contact jonathan@ualberta.ca.

APPENDIX

Amazons (2)

AmazonsPlus: Pei Zhang, Liang Chen, QianWei Wang, Tailin Liang, Ke Zhou (1429046561@qq.com)

Thésée: Quentin Cohen-Solal, Tristan Cazenave (quentin.cohen-solal@dauphine.psl.eu)

	AmazonsPlus	Thésée	**Total**
AmazonsPlus	XXX	0	**0**
Thésée	2	XXX	**2**

Congratulations to the Thésée team for the Gold Medal in Amazons.

Arimaa (1)

This competition had only one entry and was not held.

Ataxx (1)

This competition had only one entry and was not held.

Brazilian Draughts (2)

EVE: Quentin Cohen-Solal, Tristan Cazenave (quentin.cohen-solal@dauphine.psl.eu)

Tdk88: Ton Tillemans (ton_til@bluemail.ch)

	EVE	Tdk88	**Total**
EVE	XXX	1 1 1 2	**5**
Tdk88	1 1 1 0	XXX	**3**

Congratulations to the EVE team for the Gold Medal in Brazilian Draughts.

Breakthrough (2)

DaSoJai: Wei-Lin Wu, Shun-Shii Lin (b1499119139@gmail.com)

R2D2: Quentin Cohen-Solal, Tristan Cazenave (quentin.cohen-solal@dauphine.psl.eu)

	DaSoJai	R2D2	**Total**
DaSoJai	XXX	0	**0**
R2D2	2	XXX	**2**

Congratulations to the R2D2 team for the Gold Medal in Breakthrough.

Canadian Draughts (2)

T-900-Cameron: Quentin Cohen-Solal, Tristan Cazenave (quentin.cohen-solal@dauphine.psl.eu)

Tdkcan: Ton Tillemans (ton_til@bluemail.ch)

	T-900-Cameron	Tdkcan	**Total**
T-900-Cameron	XXX	2 2 2 2	**8**
Tdkcan	0 0 0 0	XXX	**0**

Congratulations to the T-900-Cameron team for the Gold Medal in Canadian Draughts.

Chinese Checkers (1)

This competition had only one entry and was not held.

Chinese Chess (2)

Shiga: Ming-Cheng Cheng, Shi-Jim Yen (sjyen@mail.ndhu.edu.tw)

Stratar: Quentin Cohen-Solal, Tristan Cazenave (quentin.cohen-solal@dauphine.psl.eu)

	Shiga	Stratar	**Total**
Shiga	XXX	2-0	**2**
Stratar	0-2	XXX	**0**

Congratulations to the Shiga team for the Gold Medal in Chinese Chess.

Chinese Dark Chess (6)

CLAP_CDC: Chu-Hsuan Hsueh, Yuan-Hao Chen, Wen-Jie Tseng, I-Chen Wu (hsuehch@jaist.ac.jp)

DarkCheese: Ping Chun Chen, Hsuan Yu Yaung, Chang Chih Yuan (a86107tommy@gmail.com)

DarkKnight: Chu-Hsuan Hsueh, Wen-Jie Tseng, I-Chen Wu (hsuehch@jaist.ac.jp)

PupilDarkChess: Cheng Yueh, Hung-Jui Chang (changhungjui@gmail.com)

Yahari: Jr-Chang Chen, You-Cheng Syu, Gang-Yu Fan, Ting-Yu Lin, Tsan-sheng Hsu, Hsuan-Yu Wang (tt40616@gmail.com)

Yanyu2.0: Yu-Yan Wang (d04405054@ems.npu.edu.tw)

	CLAP_ CDC	Dark Cheese	Dark Knight	Pupil-DarkChess	Yahari	Yanyu2.0	**Total**
CLAP_ CDC	XXX	2	2	0	1	1	**6**
DarkCheese	0	XXX	0	0	0.5	2	**2.5**
DarkKnight	0	2	XXX	2	2	1.5	**7.5**
Pupil-DarkChess	2	2	0	XXX	2	2	**8**
Yahari	1	1.5	0	0	XXX	2	**4.5**
Yanyu2.0	1	0	0.5	0	0	XXX	**1.5**

Congratulations to the PupilDarkChess team for the Gold Medal in Chinese Dark Chess.

Congratulations to the DarkKnight team for the Silver Medal in Chinese Dark Chess.

Congratulations to the CLAP_CDC team for the Bronze Medal in Chinese Dark Chess.

Clobber (1)

This competition had only one entry and was not held.

Connect6 (4)

Bernard-Lowe: Quentin Cohen-Solal, Tristan Cazenave (quentin.cohen-solal@dauphine.psl.eu)

CLAP_Connect6: Shao-Xiong Zheng, Wei-yuan Hsu, Yuan-Hao Chen, I-Chen Wu (a84959947mp45 @gmail.com)

Explorer: Yihao Wu, Miao Su, Xiaorui Li, Ke Zhou (1533176590@qq.com)

HPS6: Yu-Chang Lin, Shun-Shii Lin (yuchang103@gmail.com)

	Bernard-Lowe	CLAP_ Connect6	Explorer	HPS6	**Total**
Bernard-Lowe	XXX	1	1	2	**4**
CLAP_ Connect6	1	XXX	2	2	**5**
Explorer	1	0	XXX	2	**3**
HPS6	0	0	0	XXX	**0**

Congratulations to the CLAP_Connect6 team for the Gold Medal in Connect6.

Congratulations to the Bernard-Lowe team for the Silver Medal in Connect6.

Congratulations to the Explorer team for the Bronze Medal in Connect6.

Dice Shogi (1)

This competition had only one entry and was not held.

Draughts (3)

Tdking: Ton Tillemans (ton_til@bluemail.ch)

Tornado: Frank Mesander (f.mesander@xs4all.nl)

Zoe-A: Quentin Cohen-Solal, Tristan Cazenave (quentin.cohen-solal@dauphine.psl.eu)

	Tdking	Tornado	Zoe-A	**Total**	**Playoff**
Tdking	XXX	2 2	2 2	**8**	
Tornado	0 0	XXX	1 1	**2**	**1 0**
Zoe-A	0 0	1 1	XXX	**2**	**1 2**

Congratulations to the Tdking team for the Gold Medal in Draughts.

Congratulations to the Zoe-A team for the Silver Medal in Draughts.

EinStein Würfelt Nicht (2)

Reinstein: Zih-Yang Hsu (orange3111119@gmail.com)

VSWTN: FangYi Chen, YiHao Wu, YunPeng Zhang, Ke Zhou (1195210454@qq.com)

	Reinstein	VSWTN	**Total**
Reinstein	XXX	3	**3**
VSWTN	7	XXX	**7**

Congratulations to the VSWTN team for the Gold Medal in EinStein Würfelt Nicht.

Go (9×9) (3)

CGI Go Intelligence: T.R. Wu, G.W. Chen, C.C. Shih, M.Y. Tsai, Y.S Hsu, C.J. Chen, J.H. Wu, F. Chiang, I.C. Wu (oo12374@gmail.com)

EzGo01: Lin Hung Cheng, Yi-Ting Chiang (d94021@csie.ntu.edu.tw)

Sayuri: Hung Zhe Lin (cglemon000@gmail.com)

	CGI Go Intelligence	EzGo01	Sayuri	**Total**
CGI Go Intelligence	XXX	2-0	2-0	**4**
EzGo01	0-2	XXX	0-2	**0**
Sayuri	0-2	2-0	XXX	**2**

Congratulations to the CGI Go Intelligence team for the Gold Medal in Go (9×9).

Congratulations to the Sayuri team for the Silver Medal in Go (9×9).

Gomoku (1)

This competition had only one entry and was not held.

Havannah (8×8) (2)

Doombot-8: Quentin Cohen-Solal, Tristan Cazenave (quentin.cohen-solal@dauphine.psl.eu)

NDHU-PolyGames: Shi-Jim Yen, NDHU (sjyen@mail.ndhu.edu.tw)

	Doombot-8	NDHU-PolyGames	**Total**
Doombot-8	XXX	2	**2**
NDHU-PolyGames	0	XXX	**0**

Congratulations to the Doombot-8 team for the Gold Medal in Havannah (8×8).

Havannah (10×10) (2)

Doombot-10: Quentin Cohen-Solal, Tristan Cazenave (quentin.cohen-solal@dauphine.psl.eu)

NDHU-PolyGames: Shi-Jim Yen, NDHU (sjyen@mail.ndhu.edu.tw)

	Doombot-10	NDHU-PolyGames	Total
Doombot-10	XXX	2	**2**
NDHU-PolyGames	0	XXX	**0**

Congratulations to the Doombot-10 team for the Gold Medal in Havannah (10×10).

Hex (11×11) (2)

import *: BoChen Han, HaoQuan Zhai, KangSheng Wang, YiHao Wu, Miao Su (534217946@qq.com)

Ultron-11: Quentin Cohen-Solal, Tristan Cazenave (quentin.cohen-solal@dauphine.psl.eu)

	import *	Ultron-11	Total
import *	XXX	0	**0**
Ultron-11	2	XXX	**2**

Congratulations to the Ultron-11 team for the Gold Medal in Hex (11×11).

Hex (13×13) (2)

NDHU-PolyGames: Shi-Jim Yen, NDHU (sjyen@mail.ndhu.edu.tw)

Ultron-13: Quentin Cohen-Solal, Tristan Cazenave (quentin.cohen-solal@dauphine.psl.eu)

	NDHU-PolyGames	Ultron-13	Total
NDHU-PolyGames	XXX	0-2	**0**
Ultron-13	2-0	XXX	**2**

Congratulations to the Ultron-13 team for the Gold Medal in Hex (13×13).

Hex (19×19) (2)

NDHU-PolyGames: Shi-Jim Yen, NDHU (sjyen@mail.ndhu.edu.tw)

Ultron-19: Quentin Cohen-Solal, Tristan Cazenave (quentin.cohen-solal@dauphine.psl.eu)

	NDHU-PolyGames	Ultron-19	Total
NDHU-PolyGames	XXX	0	**0**
Ultron-19	2	XXX	**2**

Congratulations to the Ultron-19 team for the Gold Medal in Hex (19×19).

Kyoto Shogi (1)

This competition had only one entry and was not held.

Lines of Action (1)

This competition had only one entry and was not held.

Mahjong (4)

FatesGate: Zheng-Han Yeh (s9317741@yahoo.com.tw)

Seofon: Zong-Han Lin, Yu-Chen Lin, Shun-Shii Lin (kyon951118@gmail.com)

SimCat: Shih-Chieh Tang, Feng-Shen Liao, I-Chen Wu (fight5566jay@gmail.com)

VeryLongCat: Shih-Chieh Tang, Li-Kai Tsuang, I-Chen Wu (fight5566jay@gmail.com)

	Total
FatesGate	**−69500**
Seofon	**43500**
SimCat	**39000**
VeryLongCat	**−13000**

Congratulations to the Seofon team for the Gold Medal in Mahjong.

Congratulations to the SimCat team for the Silver Medal in Mahjong.

Congratulations to the VeryLongCat team for the Bronze Medal in Mahjong.

MiniShogi (2)

Megatron: Quentin Cohen-Solal, Tristan Cazenave (quentin.cohen-solal@dauphine.psl.eu)

Nyanpass: Hsuan-Yu Wang (tt40616@gmail.com)

	Megatron	Nyanpass	**Total**
Megatron	XXX	0	**0**
Nyanpass	2	XXX	**2**

Congratulations to the Nyanpass team for the Gold Medal in MiniShogi.

Nonogram (3)

Defense: Jia-Jun Yeh, Kuo-Chan Huang, Wei-Chiao Huang, Yan-Rong Guo, De-Rong Sung, Tzung-Shuan Tsai (tts628@gmail.com)

Requim: Yen-Chi Chen, Shun-Shii Lin (zxkyjimmy@gmail.com)

The Heirs: Jia-Jun Yeh, Kuo-Chan Huang, Wei-Chiao Huang, Yan-Rong Guo, Tzung-Shuan Tsai (tts628@gmail.com)

	# Solved	Time Used	**Rank**
Defense	1,000	2205.516	**3**
Requim	1,000	1515.056	**1**
The Heirs	1,000	2065.281	**2**

Congratulations to the Requim team for the Gold Medal in Nonogram.

Congratulations to the Heirs team for the Silver Medal in Nonogram.

Othello (8×8) (3)

DeepO: He-Chen Yan, Hsin-Hung Chou, Yi-Zong Zhang (z58774556@gmail.com)

Maverick: Yen-Chi Chen, Shun-Shii Lin (zxkyjimmy@gmail.com)

Réplicateur #8: Quentin Cohen-Solal, Tristan Cazenave (quentin.cohen-solal@dauphine.psl.eu)

	DeepO	Maverick	Réplicateur #8	**Total**
DeepO	XXX	0	0	**0**
Maverick	2	XXX	0.5	**2.5**
Réplicateur #8	2	1.5	XXX	**3.5**

Congratulations to the Réplicateur #8 team for the Gold Medal in Othello (8×8).

Congratulations to the Maverick team for the Silver Medal in Othello (8×8).

Othello (10×10) (1)

This competition had only one entry and was not held.

Outer-Open Gomoku (5)

CLAP_OOG: Wei-Chen Liao, Po-Wei Huang, Shao-Xiong Zheng, Yuan-Hao Chen, I-Chen Wu (alex10101025@gmail.com)

Marvin: Quentin Cohen-Solal, Tristan Cazenave (quentin.cohen-solal@dauphine.psl.eu)

Nonoku: Jiunn-Haur Chern, Shun-Shii Lin (wwes20107@gmail.com)

rm -rf /*: JiaYuan Huang, YiChen Pan, JunHong Liu, Ke Zhou (506149387@qq.com)

RuiRabbit: Jui-Yu Wang, Shun-Shii Lin (rabbit922w@gmail.com)

	CLAP_ OOG	Marvin	Nonoku	rm -rf /*	RuiRabbit	**Total**
CLAP_ OOG	XXX	2	2	0	2	**6**
Marvin	0	XXX	2	0	2	**4**
Nonoku	0	0	XXX	0	1	**1**
rm -rf /*	2	2	2	XXX	2	**8**
RuiRabbit	0	0	1	0	XXX	**1**

Congratulations to the rm -rf /* team for the Gold Medal in Outer-Open Gomoku.

Congratulations to the CLAP_ OOG team for the Silver Medal in Outer-Open Gomoku.

Congratulations to the Marvin team for the Bronze Medal in Outer-Open Gomoku.

Santorini (1)

This competition had only one entry and was not held.

Surakarta (2)

Artificial Idiot: HongJun Liu, HongWei Yu, LingZhen Kong, FangYi Chen, YuWei Zhang (Nonbiuld@gmail.com)

Athénan: Quentin Cohen-Solal, Tristan Cazenave (quentin.cohen-solal@dauphine.psl.eu)

	Artificial Idiot	Athénan	**Total**
Artificial Idiot	XXX	0	**0**
Athénan	2	XXX	**2**

Congratulations to the Athénan team for the Gold Medal in Surakarta.

Sylver Coinage (3)

leeavBot: Leeav Nagola (leeavas@gmail.com)

miniMax: Gilad Moskowitz (gilad.moskowitz@gmail.com)

strongCounterV2: Gilad Moskowitz (gilad.moskowitz@gmail.com)

	leeavBot	miniMax	Strong-CounterV2	**Total**
leeavBot	XXX	0	0	**0**
miniMax	2	XXX	0	**2**
strongCounterV2	2	2	XXX	**4**

Congratulations to the strongCounterV2 team for the Gold Medal in Sylver Coinage.

Congratulations to the miniMax team for the Silver Medal in Sylver Coinage.

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