

AI and Games at IJCAI - ECAI 2022

An interview with Prof. Jonathan Schaeffer
Editorial by Matjaž Gams

At IJCAI we had an opportunity to discuss with Jonathan Schaeffer, a Canadian artificial intelligence researcher, professor in computing science, and former dean of science at the University of Alberta, Edmonton, Alberta. He is best known as the primary author of the World Man-Machine Checkers Champion Chinook, solving Checkers in 2007. In August 2019, Jonathan Schaeffer superseded David Levy as president of the ICGA, International Computer Games Association.



Figure 1: Prof. Jonathan Schaeffer, president of ICGA.

Question: Congratulations on all achievements – which ones would you highlight?

Reply: The wistful highlight of my career was my program Chinook winning the World Checkers Championship in 1994 – the first time a computer won a human world championship in any game. I call it wistful because, sadly, our success happened at the tail end of the career of the remarkable human champion, Dr. Marion Tinsley. Soon after Chinook won the championship, Tinsley passed away from cancer.

Another highlight was solving checkers. I started computations to solve checkers running in 1989 and in 2007 they were completed. It took 18 years and hundreds of computers to announce that perfect play leads to a draw.

Question: Any comment on the IJCAI computer championship?

Reply: Man versus machine competitions in chess started in 1970. In 1974 the first World Computer Chess Championship was held. Forty-eight years later, we are still holding this competition, including here at the 2022 IJCAI conference. In the early 2000s, chess programs went superhuman. The last time a human grandmaster defeated a strong chess program was in 2005. Whereas the human World Chess Champion Magnus Carlsen has a roughly 2,850 ELO rating, the top chess computers have ratings over 3,500! The programs still get stronger every year!

Computer chess performance benchmarking is the longest-running experiment in computing science history.

Question: Are chess programs approaching their limit – playing optimally? ELO ratings stalling might indicate so.

Reply: I don't think so, although we are seeing diminishing returns for the effort expended. The limit, of course, will come when chess is "solved". However, given the roughly 10^{45} possible positions in the game, solving chess is not going to happen for a very long time (and without major hardware and software technology breakthroughs).

Question: In which games are computers optimal/dominant/comparable/worse than humans?

Reply: If we limit the discussion to the classic board and card games: Solved games include 8x8 checkers, 2-person limit Texas Hold'em poker, Awari, and so on. Superhuman games include chess, Go, shogi, backgammon, and so on. Worse include bridge.

Question: Do humans play better due to computer chess?

Reply: Yes. Computers can help humans train (available to play 24 hours a day), study the openings (checking analysis, and uncovering new lines of play), and reveal new ideas.

Question: AI and games used to be one of the main topics of research. What changed?

Reply: Building superhuman game-playing programs – especially chess – was one of the early grand-challenge problems of AI research. But 60 years of creating innovative algorithms and using ever-faster hardware has meant that this AI goal has been achieved. Time to move on to more challenging problems, such as video games.

Question: Elon Musk says that AI progress is so much faster than that of humans that it is only a matter of time when AI will supersede humans. Agreed?

Reply: Yes and no. AI has already exceeded humans in some domains, with many more to come. But there are areas where right now it is hard to see AI exceeding human abilities (do you think an AI could write like Shakespeare or paint like da Vinci?). One thing I have learned the hard way about AI is never to predict the future. There is so much innovative research happening today that tasks that seem hard now may be easy tomorrow. The game of Go was such an example. Within a year the problem of beating the world champion went from seemingly impossible to mission accomplished (2016). Never count out human ingenuity!

Question: When will superintelligence appear?

Reply: The definition of super-intelligence is not clear. AI already has some abilities that exceed those of any human in some areas.

Question: Many AI researchers imply that the progress of human civilization is in recent decades mainly due to the progress of AI. Is this an overstatement?

Reply: Yes! AI tools are already improving the quality of human life (and perhaps some that are not). AI's role will likely become much more important (and sooner, rather than later). But today we already have other technology tools that are aiding in the progress of human civilization. Smartphones. Discoveries stemming from an understanding of the human genome (including vaccines). Electric cars...

Question: AI and superintelligence should help humans as cars or robots for example. When and why appeared this freak horror about robots or AI killing humans?

Reply: I have given many public AI talks. Inevitably, someone asks “When is AI going to destroy civilization.” This question angers me. Every AI scientist that I know is working on developing AI technology for the benefit of humankind. There is an urgent need to educate the public about what AI can do – and especially what AI cannot do (or is unlikely to do).



Figure 2: Computer world championship at IJCAI 2022 in Vienna, Austria