TABLE OF CONTENTS

MULTI PLAYERS, MULTI PERSONALITIES

Three of the requirements for becoming the human World Chess Champion are: perseverance, performance, and personality. Individual players with the aspiration to reach World Champion level should train their capabilities and improve their results by a continuous learning process. However, success is not guaranteed. This is a wise lesson that many great players have experienced and some have suffered from it to a large extent.

Chess can be defined by three distinct concepts. They are *two-player, zero-sum,* and *perfect information*. All three concepts have been relaxed over the years. This issue of the *ICGA Journal* focusses on relaxing the two-player concept from two to multi. So, we consider multiple players and multiple personalities.

Moreover, it is interesting to make an inventory of the most discriminating elements when making a step from n to n+1. Although it is not in our scope, the step from a 1-player game to a 2-player game has as its discriminating element the research area of opponent modelling. When going from 2 to 3 we see that the traditional alpha-beta search has to be replaced by another minimax-based search algorithm, such as max^{n}, paranoid, or Best Reply Search, or by an MCTS variant of them. A precise overview of search policies in multi-player games is given by Pim Nijssen and Mark Winands (pp. 3-21). The layman reader may wonder why a paranoid personality is included in the above list. Yet, the first researchers who mentioned this policy were John von Neumann and Oscar Morgenstern. When going from 3 to 4, Nijssen and Winands conclude that the win rate of the player using MP-MCTS-Solver is well below 50% for the paranoid and the first-winner update rules. It implies that there is a long road of research ahead of us.

Of course, we may call psychologists to help us find shortcuts in this research plan. That is a difficult task in itself. In fact, opponent modelling is a first step, but there are many more possibilities even in 1-player or 2-player games, apart from varying the personality profiles of the opponent. The key topic of the psychological approach is "quantifying individual player differences".

Giel van Lankveld has performed his Ph.D. research on this topic and Dap Hartmann discusses the results in his Review "*Ludo Ergo Sum*: Does Game Playing Reveal Your Personality" (pp. 44-45). Hartmann brings the problem statement back to the following fundamental question: Can computer games be used to determine a person's psychological profile? He meticulously reviews the thesis, emphasising the computer science and

artificial intelligence aspects, but not the psychology aspect. Clearly, here we are at the very beginning of the path starting at 1-player games and heading towards *n*-player games. Hartmann gives us food for thought and reflection, which brings us to the next topic.

The replacement of the Notes section by a section of Reflections inspired Aviezri Fraenkel to a further communication on the Monte Carlo methods as used in Monte Carlo sampling and Monte Carlo Tree Search (MCTS) (see p. 49). He correctly remarks that ideas on the use of Monte Carlo techniques already emerged in the 1940s when Fermi and Buffon voiced the first steps. The real credit goes to Stanislaw Ulam (see Fraenkel's Reflection) whose work we know from the 6x6 Los Alamos Chess program in the 1950s. Fraenkel mentions his connections and expresses his respect for Ulam. The only thing I may add to this is that Stanislaw Ulam was a genius who lived in a different era. To substantiate this statement I provide some information recently revealed by Robbert Dijkgraaf, the current President of the Institute for Advanced Study (IAS) in Princeton, in the Dutch daily newspaper NRC Handelsblad.

"In cooperation with the Rockefeller Foundation small scholarships were made available for threatened scientists to come to the United States. It is bizarre to see the list of the "very modest offers" to excellent scientists. For instance, Kurt Gödel (…) received a grant of $ 1,000 and the Polish mathematician Stan Ulam (…) only $ 300."

Now, seventy years later, particle physics and chess are both at a new stage. For particle physics, it is due to the Higgs boson and the possibility to reformulate the standard model with the help of MCTS. For chess the state of the art is demonstrated by the fact that the playing strength of the strongest programs lies between "stronger than the human World Champion" and "not yet solved".

In this area, experts in handling computer chess programs in combination with a love for chess may enjoy finding the best move by man-machine interaction. The Dutch amateur chess player Ron Langeveld (46) is the perfect example of the combination described above. Playing in correspondence chess competitions he analysed every chess position under investigation to a sufficient depth. Here 'sufficient' means up to far in the endgame, since only there discrimination between good and bad is possible, according to Ron.

Langeveld started his Sisyphus work in 2001, in the first qualification round of the World Correspondence Chess Championship. In 2005, Ron played the semi finals and in 2010 the finals started. In 2012, Ron succeeded (in some sense) Hans Berliner. After twelve years of handling and probing computer programs, Ron reached his goal of being a human World Chess Champion in Correspondence Chess. He definitively showed perseverance, performance, and personality.

Jaap van den Herik

The credits of the photographs in this issue are to: Shi-Jim Yen and Manchester Evening News.