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## AIMS AND GAMES

In the last sixty years the computer world has seen a considerable change of scientific aims. Within the current scope of this Journal we restrict ourselves to the domain of games. But even here, the change of aims is immense. In the 1940s the prevailing aim was: to build a computer program that played a reasonable game of chess (Shannon, Turing) or checkers (Samuel). Continuous and persistent research managed to achieve this goal, say within some 30 years.

Without much emphasis we would like to remark that in this editorial we disregard philosophical issues, such as whether computers and human beings actually play the same game. We simply focus on the results of matches calibrating the computers' playing strength with that of the human beings. In this respect we may divide the game research into three stages, viz. playing a reasonable game, playing at human World Championship level, and solving the game.

For chess, we believe that we reached the first goal around 1980 (CHESS4.6, BELLE) and the second goal some twenty(five) years later (DEEP BLUE, FRITZ, DEEP JUNIOR); the third goal is still not in discussion. This state of affairs is in clear contrast to that of checkers. There Samuel's program was credited for playing a reasonable game around 1960 (here 'reasonable' should be defined more precisely, but this is not our task). In 1994 CHINOOK definitely played at World Championship level. The team led by Jonathan Schaeffer has now set its aim at solving the game of checkers. Your Editor expects to hear soon more of their (partial) results. They have a preliminary proof of one opening and are verifying the results for accuracy and completeness.

Above we followed the three stages of the chess-and-checkers paradigm; but there are more paradigms. For instance, around 1980 a clear shift of paradigm started, although at that time nobody actually understood what

happened. New games such as Go and Scrabble entered the scene and found their way to the research projects at the universities and beyond. New AI techniques were developed and emphasis was on knowledge and the understanding of knowledge and strategies. Search was relegated to a lower position.

Obviously, the life cycle of Scrabble is different from that of Go. The program MAVEN had many successes in matches with Scrabble Grandmasters and arrived at the top recently, i.e., it fulfilled the goal of surpassing the playing strength of the best human beings. The performance was archived in *Towards Perfect Play of Scrabble* (2002) which the ICGA awarded in Ramat-Gan (2004) with the best contribution to the game-research field. Moreover, the investigations in the game of Go soon seem to lead to fruitful results, too; some even expect a breakthrough in the near future.

Having Go as the current research paradigm, one might wonder what the successor paradigm will be. In my opinion, the choice of paradigms is not only guided by the complexity of the game, but also by its popularity, its learnability, and its degree of inspiration. Taking the latter three items as criteria we can see that, in the footsteps of Go, the Asian games Shogi and Chinese Chess are nowadays regularly the subject of scientific analysis and interesting competition reports in Journals and Conference Proceedings. For instance, this issue reports on the first World Computer Chinese-Chess Championship. Moreover, the report announces the 2<sup>nd</sup> and 3<sup>rd</sup> Championship in 2007 and 2010. Before 2012 a match with a strong Grand Master is envisaged. The report on pp. 186-188 reads as a research road map.

So, the sixty years of game-research development have led to a distinction of three stages of a research aim and to three different sets of paradigms.

The line of research mentioned above can also be found as a thread through the publications of the last sixty years. In such a modified view we may see the developments as follows. Chess and Checkers branched out into three directions: (1) investigating easier games (e.g., Connect Four, Go Moku), (2) pursuing the own aims, (3) launching projects of more difficult games (e.g., Go, Scrabble). The first branch led to the solution of several games. So, these researchers achieved their aims for some part. What we see now is that researchers both from the first branch and the second branch lead their research efforts to solving the game they are involved with.

This issue reports on the first steps of an interesting attempt on how to solve the game *Tigers and Goats*. Moreover, it reports on many other games too, such as battleships, chess, bridge, and, of course, the games played at the successful 9<sup>th</sup> Computer Olympiad in Ramat-Gan. Admittedly, the reports of the 12<sup>th</sup> WCCC, the 9<sup>th</sup> CO, and the 4<sup>th</sup> Computers and Games Conference put some emphasis on Ramat-Gan. Yet, it was a major event and in my opinion the organisers deserve extra attention and words of praise.

Jaap van den Herik