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MANY VARIANTS OF CHESS

The advances in computer-chess research and in particular the progress in playing strength of chess programs have led to broadening the scope of this Journal. The change of attention was embodied in a change of name: from *ICCA Journal* to *ICGA Journal* (the Journal of the International Computer Games Association). Still even under the new name, chess is the preferred testbed of our research efforts. Many techniques are now applied in other domains; some failed and some were successful. Notoriously is the failure of the search-and-evaluate paradigm in the domain of Go. Here, new techniques such as MCTS (Monte-Carlo Tree Search) and UCT (Upper Confidence bound applied to Trees) were found to work well.

In this issue we would like to stress that other computer-chess techniques turned out to result in new knowledge on chess-related games and in popularizing these games. Of course, for each such a game the results might be expected by the chess-related application domain. Yet, the proof is in the results and this issue reports on successful applications of the learning techniques (TD(λ) and TDleaf (λ)) and the proof-number search variant (PN^2). The learning techniques are applied to three variants of Chess: Suicide Chess (also known as Giveaway Chess), Crazyhouse Chess (derived from the four-player Bughouse Chess), and Atomic Chess (capturing a piece leads to an explosion).

The essence of this research is (1) to learn the values of the pieces, and (2) to learn the values of the squares in the piece-square tables. So, the research in itself is not new, but the application is. Therefore, the resultant knowledge is new, too. Many references are given by the authors (Sacha Droste and Johannes Fürnkranz) to the well-known researchers in this domain, starting with Samuel (1959). The games are explained extensively and the investigations read as an unputdownable essay. Despite their multitude of research findings the authors admit that after forty years of intensive research they still concur with Samuel's (1959) statement, repeated in his 1967 article: "... getting the program to generate its own parameters remains as far in the future as it seemed to be in 1959." Maybe strongly solving a game provides some clues to the composition of an evaluation function. However, this may already be too bold a statement which might be only applied to chess-related games. The first step to be made here is the transition from weakly solving to strongly solving.

At this moment we consider weakly solving a game as a performance in itself. The most prestigious example is of course solving Checkers as performed and reported by Schaeffer *et al.* (2007). For some games weakly

solving a game start by weakly solving little-brother games. Examples of such an approach are Go, Hex, LOA, and Othello. In this issue Mark Winands informs us on weakly solving 6x6 Lines of Action. The game is a win for the first player (Black). Extrapolating the results of the little-brother boards yields an optimistic time frame for weakly solving 7x7 LOA (2020) and 8x8 LOA (2030).

In some sense we may consider the two contributions mentioned above as *Variants of Chess*, since they *deepen* the original research area, i.e., they investigate and report on chess-related games. However, *broadening* the scope should also be applied by the *ICGA Journal*. It means paying attention to non-chess related games and to other techniques. The contribution by Nathan Sturtevant meets both requirements, since (1) it deals with UCT in multi-player games, and (2) the UCT techniques are applied to Chinese Checkers, Hearts, and Spades. The experiments show that the branching factor and the *n*-ply state variance are correlated with the success of the techniques.

In summary, all investigations reported in this issue of the Journal are broadening and deepening the research area. The availibility of faster machines and extensive storage makes it possible for us to continue in revealing new findings. The *ICGA Journal* is pleased to keep our readers up to date about the progress made in the field of Computer and Games.

Jaap van den Herik

References

Samuel, A.L. (1959). Some studies in machine learning using the game of checkers. *IBM Journal of Research and Development*, Vol. 3, No. 3, pp. 211-229.

Samuel, A.L. (1967). Some studies in machine learning using the game of checkers. II-recent progress. *IBM Journal of Research and Development*, Vol. 11, No. 6, pp. 601-617.

Schaeffer, J., Burch, N., Björnsson, Y., Kishimoto, A., Müller, M., Lake, R., Lu, P., and Sutphen, S. (2007). Checkers is Solved. *Science*, Vol. 317, No. 5844, pp. 1518 – 1522.

WELCOME AND FAREWELL

The composition and production of the *ICGA Journal* is an interesting but laborious task, as is the editing of all contributions, being articles, notes, and reports. From January 1, 2007, the Editor-in-Chief was pleased with the support by Dr. Mark Winands as Deputy Editor. In 2008, he chose to stay in Maastricht as Assistant Professor instead of moving to Tilburg. At the same time he decided to step down as Deputy Editor of the Journal. Of course, he would like to remain connected with our community (see his current contribution on Solving 6x6 LOA) and therefore the Editorial Board is pleased that he was prepared to serve as a member of the Editorial Board, starting January 1, 2009.

The Editorial Board and all other ICGA officials would like to thank Mark for the smooth cooperation over the years and wish him much success as Assistant Professor in Maastricht. – Ed.

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