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STONEHENGE SOLVED

For centuries Stonehenge has been a mystery. Nobody knows how to address it and where to start the investigations. The main question is: why was it built? Yet, there are other questions too. They are of subordinate importance, such as what is the precise place of the first foundations? When was Stonehenge first used as a meeting place? What is the relation between Stonehenge and the position of the Sun? These questions can be considered as scientific riddles. Scientists discovered that there were two Stonehenges, quite close to each other. Continuous research brought many more things to light, but the name Stonehenge is now permanently associated with mysterious matters that deserve to be investigated. With such a background it is no wonder that one of our community members, Reiner Knizia, used the name Stonehenge for an intricate two-person perfect-information game. The game was coined as Stonehenge in 1993. However, some sources mention that Knizia invented another game (different from the current one) under this name. Whatever the case, the game is worthy of having the name of a riddle that should be solved. So, the name is well chosen and the current description of the game is attractive (see p. 34 of this issue, together with the footnote).

Complex games are challenges up to the moment that they are solved. However, generalisations of the game solved can take their place, as is the case with Stonehenge. In a well-formulated note the Japanese researchers Yasuhiko Takenaga, Hikari Mori, and Shigeki Iwata report their findings: (1) Stonehenge has been solved, and (2) a generalisation of Stonehenge is PSPACE-complete. The solution has been established by two of the authors who independently constructed a computer program that mastered the graph of 15 straight lines and 18 intersections. Their outcomes concurred and so we may safely assume that the game has been solved. For details we encourage the reader to read the note to see why Stonehenge is a win for the first player.

Turning to the game of chess, many of the intricacies for this game are still a mystery for players and programmers alike. With much pleasure your Editor sees that the programmers of two top chess programs, LOOP and FALCON in this case, have combined their secret efforts with scientific publications. Both authors,

Fritz Reul (author of LOOP LEIDEN and LOOP AMSTERDAM) and Omid David-Tabibi (author of FALCON) have transferred their knowledge into a scientific proof of their skills by defending a Ph.D. thesis. Fritz Reul's thesis, titled *New Architectures in Computer Chess,* was reviewed by Dap Hartmann in a previous issue (Vol. 32, No. 2, pp. 93-94) and Omid David-Tabibi's thesis, titled *Genetic Algorithms Based Learning for Evolving Intelligent Organisms,* is reviewed in this issue (pp. 42-43). Moreover, Fritz Reul has reworked a part of his thesis into a contribution (see pp. 3-17 of this issue) that gives much insights into the strength of his program. As is usual with scientific publications and with notable successes (LOOP won second place in Leiden 2006 and third place in the WCCC 2007 in Amsterdam), the ideas by Reul are embraced by a large part of our community, but denied by another part. The nature of this discussion is purely scientific. Reul believes that finding the best moves relies on *knowledge*: better knowledge leads to better decisions. So, a Static Exchange Evaluation (SEE) is preferred. His opponents believe that static evaluations will always be fallible, since our knowledge of the game is not perfect. Therefore they prefer a dynamic evaluation, i.e., continuation of the search. Their argument is that dynamic evaluations can uncover more tactical features than can be found by static evaluations. The interesting remaining question to answer is: "Does the 15 percent speed improvement obtained by using SEE compensate for the possible introduction of a small evaluation error?"

In chess, knowledge versus search is still a debate. In Go, search seems to be the winner. A proper account of the new successes by MOGOTW (MOGO Taiwan) is given by Wang, Lee, Wang, Cheng, Teytaud, and Yen on pages 47-50. MOGOTW has received three official certificates for its playing strength. For 19x19 Go, the future is bright. We look forward to the competition at JAIST.

Jaap van den Herik

The credits of the photographs in this issue are to: Chang-Shing Lee.

Welcome to the New Deputy Editor

With much pleasure I would like to announce that as of January 1, 2010 Professor Aske Plaat has taken up the post of Deputy Editor of the ICGA Journal. Aske Plaat is well known in our community as the originator of the MTD(f) search procedure. After his Ph.D. thesis, titled *Research Re: Search & Re-Search,* he left our community and developed a career elsewhere. Beginning September 1, 2009 he returned as a part-time Professor at Tilburg University, as a member of TiCC (Tilburg centre for Creative Computing). The Editorial Board has high expectations for the new relationship. We wish Aske to have fruitful collaborations with authors, readers, and referees, and assume that our community concurs.

Jaap van den Herik
Editor-in-Chief

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