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FROM COGNITION TO PERCEPTION

This is the last issue of the twentieth century. It is an excellent viewpoint to analyse the past and to predict the future. Although a century has one hundred years we take a time span of sixty years on both sides, since it was only in the 1940s that researchers managed to build an actual computer. A debate on the scientific priority of who was the first to construct such a machine was concluded around 1970. Then it became apparent that John V. Atanasoff had invented the first electronic computer in 1939 and therefore should have the patent rights. In Europe, Konrad Zuse was the very first person to have developed a prototype computer with his Z3 machine of 1941. It was quite prophetic that Zuse considered the royal game of chess as one of the most challenging tasks to be performed by his machine.

Around 1950 the first commercial computers entered society. They were good at counting and calculating and one can only wonder what happened to them when they recently failed so obviously in Miami, Florida. After counting and computing partial differential equations, computers showed up in bookkeeping and other administrative business as well as in the world of intelligent actions, such as translation, theorem proving, and games. In particular, chess and checkers were chosen as the first domains in which computers were given a chance to excel. As we all know it took the playing programs half a century to arrive at the level of World Champion. A striking difference with the past is that the current superiority of a chess or checkers computer will never again be challenged by any human being, i.e., the checkers program CHINOOK now reigns supremely and the various chess programs belong to the world top. Still, for researchers there remains the ultimate question of the theoretical outcome of the game. For checkers, it is expected to be solved within the next ten years; for chess, it is far beyond any conceivable reach (a distributed program should run approximately one hundred centuries to establish the result).

After Kasparov's defeat by DEEP BLUE in 1997, the Editors of the former *ICCA Journal* preferred to broaden the scope of the research reported from chess to games. The transition was effected last year by modifying the name into *ICGA Journal*. If we now look back at the games dealt with in a scientific manner in the *ICGA*

Journal (including the current issue) we see that the following games have been addressed: Awari, Chess, Go, Kalah, Kriegspiel, and RoShamBo as well as Planning seen as a game, and the topic of problem solving as in Tsume Shogi. Moreover, reports of competitions and descriptions of other games were published, such as on Amazons, Bridge, Hex, Lines of Action, Shogi, and Shuffle Chess. A respectable list. On the one hand it should be extended in the century to come, and on the other hand the length of the list should vary since persistent researchers will crack some games or solve them.

This issue also records changes in the Board of ICCA. Don Beal stepped down as a Secretary-Treasurer after many years of outstanding service. He is succeeded by Hiroyuki Iida, who is expected to realise an effective broadening of our scope. Besides Don's stepping down we saw the retirement of Ken Thompson. He left Bell Laboratories after more than a quarter of a century of research and will now spend his time on his hobby, teaching amateur pilots. We thank him for the outstanding contributions he made to the world of computer chess and will pay more attention to his many merits in a next (special) issue.

There are two obituaries: one of a renowned scientist, David Champernowne, and the other of an eminent entrepreneur, Sidney Samole. Together with Turing, Champernowne was (one of) the first who developed a computer-chess algorithm (around 1950). A quarter of a century later this algorithm formed the basis of Samole's commercial success: a chess-playing microcomputer available for all. Even the Pyrrhonistic sceptics had to concede that a silicon box could move the pieces according to the rules, which looked like playing chess. Grandmasters laughed at it, but the commercial advance was irresistible. Obviously, the process of cognition had settled an agreement with computer technology. However, we do not know where this agreement will lead us.

Meanwhile we are at the start of a new century, of which the computer buzzwords are: data mining, telecommunications, e-commerce, and mobile technology. We see soccer players at the scientific conferences and chess players opting for the Olympic Games. The time of autonomous agents has arrived and the scientific obstacles are shifting from cognition to perception. The questions *Where is my King?* and *Is my King in danger?* characterise the past century. The twenty-first century will stress the questions: *Where is the ball?* and *What can I do with it?* Around 2050 a computerized robot team will play an acceptable game of football. The process of perception will then be conceived by chips.

Returning to thinking games and thought processes a fundamental question of Artificial Intelligence might be answered in 2060: can human intuition be captured in a silicon box?

For many computer-games researchers this question is already a guideline for investigation. In the next years this Journal hopes to report on solutions of games, both old and new, and on the unravelling of the intricacies of cognition and perception in games.

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A complete list of all articles, notes, and literature reviews published in the *ICCA Journal* and the *ICGA Journal* is available on the Internet at http://www.dcs.qmw.ac.uk/~icca/toc.htm

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[1] The publication of this issue was delayed due to the passing away of the Editor's father. Thank you for the letters of sympathy. I will now be able to concentrate on preparing the March issue. - vdH.