REFLECTION

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In the December 2012 issue of the ICGA Journal, both Dr. David Levy (2012) and Professor Jaap van den Herik (2012) suggested in their respective contributions, that the Monte Carlo Tree Search method (MCTS), applied successfully to computer Go and computer chess, may be or will be applied successfully to nuclear physics, citing Van den Herik et al. (2013), *Connecting Sciences*.

The late Stanislaw Ulam invented the Monte Carlo method in 1949 in order to solve problems in nuclear physics (see Metropolis and Ulam, 1949), while working at the Manhattan project developing nuclear weapons, and contributing to the major breakthroughs of their time. In fact, the idea occurred to him in 1946, while trying to estimate the chances of winning Canfield solitaire. Even much before Ulam, Enrico Fermi, Buffon (the "needle experiment"), and others experimented with precursors of the method.

The Monte Carlo method has since been used extensively and successfully in space-shuttle re-entry aerodynamics, operations research, physical chemistry, numerical integration, finance and many more, in addition to physics. I was glad to see that the ideas of Stan Ulam on games and physics re-emerged after almost 70 years. Stan was a theoretical mathematician, but excelled also in applied math, physics and biology, and was involved with the early 6 x 6 computer chess program. Above all, he was extraordinarily original. He used to visit at the Weizmann Institute, and I visited him in Boulder, CO. One of his sayings was:

> *"It is still an unending source of surprise for me to see how a few scribbles on a blackboard or on a sheet of paper could change the course of human affairs."*

It is no surprise to me – if the scribbling is empowered by an Ulam brain.

References

Herik, H.J. van den (2012). Reflections. *ICGA Journal*, Vol. 35, No. 4, pp. 193-194.

Herk, H.J. van den, Plaat, A., Kuipers, J., and Vermaseren, J.A.M. (2013). Connecting Sciences. *5th Intern. Conference on Agents and Artificial Intelligence*, ICAART 2013, Barcelona, Spain, invited paper (keynote) IS7-IS16.

Levy, D. (2012). From Computer Games to a Global Brain. *ICGA Journal*, Vol. 35, No. 4, pp. 220-224.

Metropolis, N. and Ulam, S. (1949). The Monte Carlo Method. *J. Am. Statist. Assoc.* Vol. 44, pp. 335–341.

CALENDAR FOR THE EVENTS IN 2013

12-18 August, 2013
The 20th World Computer Chess Championship (WCCC).

12-18 August, 2013
The 4th World Chess Software Championship (WCSC).

12-18 August, 2013
The 17th Computer Olympiad.

13-15 August, 2013
The CG2013 Conference.

16 August, 2013
Workshop Computer Games and Intelligence.

16 August, 2013
The World Computer Chess Blitz Championship.

Location of all events is the Pacifico center (http://www.pacifico.co.jp/english/index.html). Information: Dr. Ito (ito@cs.uec.ac.jp), for the Workshop and Johanna Hellemons, info@icga.org for all other events listed above.

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