Modern Masters of an Ancient Game

Carol McKenna Hamilton and Sara Hedberg

The $100,000 Fredkin Prize for Computer Chess, created in 1980 to honor the first program to beat a reigning world chess champion, was awarded to the inventors of the Deep Blue chess machine Tuesday, July 29, at the annual meeting of the American Association for Artificial Intelligence (AAAI) in Providence, Rhode Island.

Deep Blue beat world chess champion Gary Kasparov in the final game of a tied, six-game match last May 11. Kasparov had beaten the machine in an earlier match held in February 1996.

The Fredkin Prize was awarded under the auspices of AAAI; funds had been held in trust at Carnegie Mellon University.

The Fredkin Prize was originally established at Carnegie Mellon University 17 years ago by Massachusetts Institute of Technology Computer Science Professor Edward Fredkin to encourage continued research progress in computer chess. The prize was three-tiered. The first award of $5,000 was given to two scientists from Bell Laboratories who in 1981 developed the first chess machine to achieve master status.

Seven years later, the intermediate prize of $10,000 for the first chess machine to reach international master status was awarded in 1988 to five Carnegie Mellon graduate students who built Deep Thought, the precursor to Deep Blue, at the university. Soon thereafter, the team moved to IBM, where they have been ever since, working under wraps on Deep Blue.
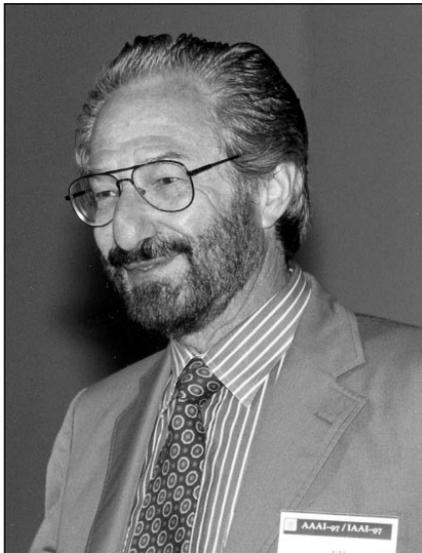
The $100,000 third tier of the prize was awarded at AAAI–97 to this IBM team, who built the first computer chess machine that beat a world chess champion.

The members of the Deep Blue team were also honored for their achievement with the Allen Newell Research Excellence Medal, sponsored by Carnegie Mellon University. Allen Newell Medals were presented to each of the major researchers in the field whose earlier contributions ultimately led to the success of Deep Blue. These individuals included Richard Greenblatt (MacHack VI); David J. Slate and Lawrence R. Atkin (CHESS 4.7); Ken Thompson and Joe Condon (Belle); Hans Berliner, Carl Ebeling, Gordon Goetsch and Murray Campbell (Hitech); and Feng H. Hsu, Murray Campbell, Thomas Anantharaman, Andreas Nowatzyk, and Mike Browne (Deep Thought).

Immediately following the awards ceremony, one member of each research team explained what the major contributions to progress that the

Deep Blue Team members. Sitting Left to Right: Joel Benjamin and C. J. Tan. Back, Left to Right: Jerry Brody, Murray Campbell, F. H. Hsu, and Joe Hoane.

Professor Ed Fredkin.

*Feng H. Hsu Explains
Deep Blue at AAAI–97.*

Teams honored at AAAI 97

- **Mac Hack 6,** developed by Richard Greenblatt at the Massachusetts Institute of Technology, was the first computer program to play in a human chess tournament. It was the first program to play and win in a tournament game in 1967.

- **The Northwestern University computer chess program,** developed by David Slate and Larry Atkin from the 1960s to the early 1980s, won several computer chess championships during the 1970s, including the computer world championship in 1977.

- **Belle,** developed by Ken Thompson and Joe Condon at Bell Labs, was the first chess program to obtain the United States Chess Federation Master title in 1983. It was awarded the first Fredkin Prize of $5,000 for this achievement.

- **Hitech,** developed at Carnegie Mellon by Hans Berliner, Carl Ebeling, Murray Campbell and Gordon Goetsch, was the first system to achieve a Senior Master's level of performance in 1988.

- **Deep Thought,** developed at Carnegie Mellon by Thomas Anantharaman, Murray Campbell, Feng Hsu, Andreas Nowatzyk and Mike Brown, was the first system to play at the Grandmaster level. Deep Thought was awarded the $10,000 Fredkin Intermediate Prize for this achievement in 1988.

- **Deep Blue,** a parallel supercomputer that processes an average of 200 million chess positions per second, is the first chess machine to draw and beat a world chess champion in a regulation game, and the first chess machine to beat the world champion in a regulation match.

team made; the motivation for doing this in the first place; major milestones in computer chess, and who achieved them; and noted what they saw left to do in computer chess.

"There has never been any doubt in my mind that a computer would ultimately beat a reigning world chess champion," said Fredkin. "The question has always been when."

"Like many other grand challenge problems in AI that have been with us for a long time, chess has had a continuous and exciting history," said Raj Reddy, dean of the School of Computer Science at Carnegie Mellon and session chairman of the chess event. "It's wonderful to have this opportunity to honor these pioneers. They engineered chess programs that outclassed all other systems of their time. It is very appropriate that AAAI honor them on this historic occasion."

*IBM Deep Blue Team Members Murray Campbell and
Joel Benjamin Discuss Strategy Prior to the Rematch.*