Humans and Computers Vie for Chess Cup

Photograph: Krystyna Wiekiewicz

Grandmaster Joel Benjamin (above defeating the winning computer program, Heuristic's Socrates Esp) also captured the 4th Harvard Cup title.

Each year, advances in hardware and software close the gap between the brute force of computer chess strategy and the collective abilities of their human opponents. To explore how fast that gap is closing, The Computer Museum will host the 5th Harvard Cup: Human vs. Computer Chess Challenge, Saturday, October 1-Sunday, October 2, 1994.

Although our capacity to imagine and create mechanical "peers" goes back to Homer, it has grown dramatically in the last 200 years. Mary Shelley's *Frankenstein*, *The Wizard of Oz*'s Tin Man, and more recently, the computer powerhouse HAL 9000 from "2001: A Space Odyssey" all capture our fascination with the potential of technology to emulate human intelligence and emotions. As the second millenium ends, advances in computing will enable us, at least in part, to turn these fictions into realities.

Premier Showcase

In November 1993, spectators filled the Museum's auditorium, eager to witness the 4th Harvard Cup, the only annual event in which grandmasters—the highest player ranking in professional chess—compete against computers. The Harvard Cup has become the premier showcase for grandmasters to test their acuity against commercially available personal computer applications and dedicated chessplaying machines. The 1993 Challenge was the first in which applications ran on Intel Pentium™ processor-based machines.

"Years ago, it would have been inconceivable that computers could play chess so well," observed Christopher J. Chabris, editor of the American Chess Journal and Challenge co-organizer. "Today, we're on the cusp between a time when the development and execution of complex strategies were solely human and when they will be successfully emulated by computers."

1993 Harvard Cup Winners

Grandmaster Joel Benjamin and Socrates Exp, a chess application developed by Heuristic Software, captured the Cup title, winning six and three games, respectively. In the Scheveningen-style Challenge, one team, in this case the American grandmasters, round robins with a second team, the chess-playing computers, in a series of 36 games.

The 1993 Harvard Cup grandmasters scored 27 of 36 possible points: Benjamin scored six of six; New England Champion Alexander Ivanov scored five; U.S. Chess Champion Patrick Wolff, Former Soviet Chess Champion Boris Gulko and World Junior Champion Ilya Gurevich each scored four and a half; Defending Harvard Cup Champion Michael Rohde scored two and a half.

The team of computers scored nine points: Socrates Exp scored three; ChessSystem R30, a dedicated chessplaying machine designed by the Dutch-based TASC Company, scored a draw and two grandmaster scalps; BattleChess 4000 SVGA, an animated software application from Interplay Productions, scored a win and a draw; M-Chess Professional, a software application by Marty Hirsch, drew one and was the only machine to defeat Wolff; Renaissance SPARC, a dedicated chessplaying computer from Saitek Industries, Ltd., scored a draw; Kasparov's Gambit, a software application from Electronic Arts of San Mateo, California, secured a winning position against Benjamin, but ultimately lost on time.

Closing the Gap?

In the first Harvard Cup in 1989, the computers won a mere nine percent of the total points. Each year, with advances in processing power and software, the computers' performances improved, capturing 28 percent in 1992.

With the arrival of Intel's Pentium processor in 1993, observers, including Larry Kaufman, editor of Computer Chess Reports, predicted the computers would amass many victories over their human competitors. Although application speed and performance improved—many almost defeated grandmasters, but lost on time—and the computers won 25 percent of the total points, they performed slightly lower than the 1992 high of 28 percent.

"Undoubtedly, this year's spectacular performance by Heuristic's Socrates was due to the Pentium processor," said Kaufman. "The more sophisticated hardware enabled the programs to play perhaps twice as fast as last year."

More than anything else, processing speed now benefits chessplaying programs as they search vast databases and "evaluate" potential moves, often anticipating millions of subsequent actions and reactions to determine "the best" move. While humans rely on knowledge, experience, intuition, and imagination, computers rely solely on databases and evaluation functions; faster processors enable more exhaustive database searches, and more advanced functions yield more successful and "human-like" strategies.

As for the 5th Harvard Cup, Chabris said, "It will be interesting to see what happens once refinements in the software catch up with the hardware."

The 4th Harvard Cup was sponsored by the Intel Corporation, IBM PC Company, Electronic Arts, Interplay Productions, Amerigames International, American Chess Foundation, United States Chess Federation, Milburn Corporation and Malcolm H. Weiner and was produced by Christopher Chabris and Daniel Edelman in conjunction with the Harvard Chess Club.