Beyond Checkmate

When Swiss psychologist Jean Piaget was formulating his cognitive development theory, he spent a lot of time observing the play of children. He assumed children developed understanding of themselves and their surroundings through play. In a perverse parallel, we have taken to watching computers play our human games to measure their growth as well.

A turning point in the history of artificial intelligence was the defeat of grandmaster Gary Kasparov at the hands of IBM's Deep Blue program 10 years ago next month. Kasparov was the highest-rated human chess player in the history of the game, yet Deep Blue won the 1997 match with two wins, one loss, and three draws. That Kasparov won one and tied three might seem surprising as Deep Blue was able to analyze 200 million board positions per second. Recently (December 2006) the current world champion, Vladimir Kramnik of Russia, lost a six-game match to the Deep Fritz program, four games to two. After the defeat, Monty Newborn, the computer scientist from McGill University who helped arrange the Kasparov match, said the Kramnik loss might end interest in matches between humans and computers. In a *New York Times* story, he explained, "I don't know what one could get out of it at this point. The science is done."

So where are we now? Are we done, too?

Well, if your growth yardstick is games, the contest isn't over. There's a classic game that's been taught to computers—a game that no computer plays well enough to beat good human players. Go, or Wei-Ki in Chinese, is the oldest board game in the world—three times as old as chess. Ironically, it looks like something a computer might have invented. There are two color stones (black and white) on a matrix of 19 × 19 rows and columns. Once placed on the board, the stones don't move unless they're captured. As you place each piece, you try to surround an enemy piece or block his stones from surrounding and capturing yours.

You would think the game would be a snap for some program that creates decision trees with branching, move-countermove analyses. Well, the moves are fairly simple, but because, unlike chess, each piece has the same value, the program would have to mentally play out all the permutations to the end of the game to optimize each move. The complexity is staggering and well beyond any computer today. The best programs lose regularly to mediocre human players, even on the reduced size 9 × 9 boards. In fact, computers can only guarantee wins on a completely unofficial 5 × 5 board. The reason? Humans are very good at pattern recognition.

So if you're bummed out by the 10-year Kasparov anniversary, browse over to www.pandanet.co.jp/English/learning_go/learning_go_1.html and check out the rules for Go. It's not only the planet's oldest game—it's still ours. ■

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