ESSAY

# Chess-Championship Results Show Powerful Role of Computers

*The digital revolution has pushed human abilities to new heights*

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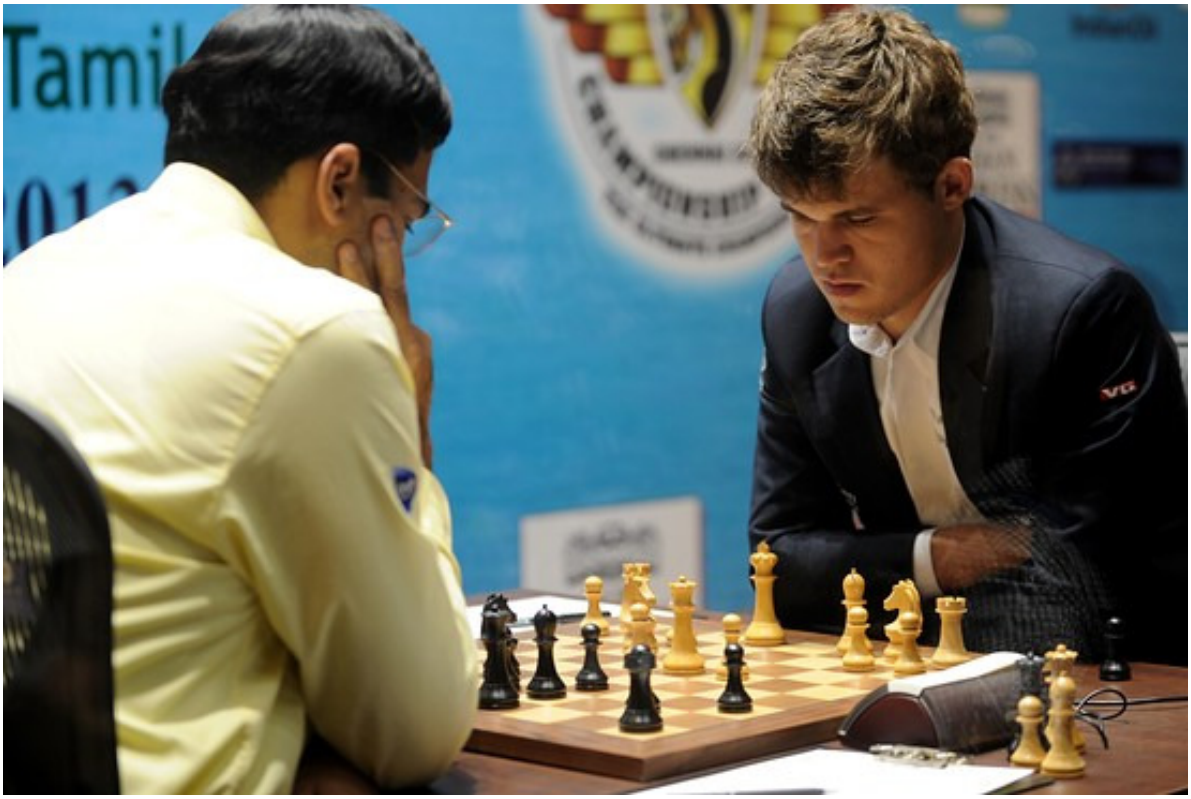
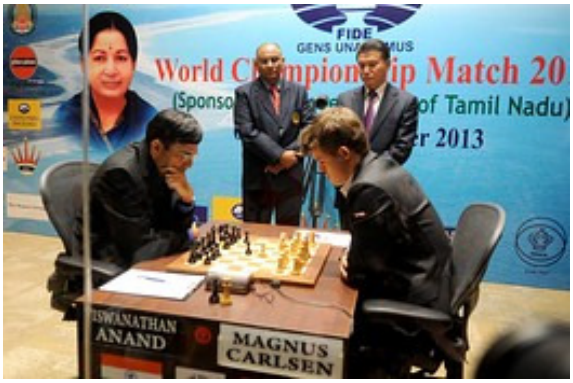


Norway's Magnus Carlsen, right, plays India's Viswanathan Anand Friday in the world chess championship. *Agence France-Presse/Getty Images*

In the world chess championship match that ended Friday in India, Norway's Magnus Carlsen, the cool, charismatic 22-year-old challenger and the highest-rated player in chess history, defeated local hero Viswanathan Anand, the 43-year-old champion. Mr. Carlsen's winning score of three wins and seven draws will cement his place among the game's all-time greats. But his success also illustrates a paradoxical development: Chess-playing computers, far from revealing the limits of human ability, have actually pushed it to new heights.

## Anand and Carlsen Battle

The last chess match to get as much publicity as Mr. Carlsen's triumph was the 1997 contest between then-champion Garry Kasparov and International Business Machines Corp.'s Deep Blue computer in New York City. Some observers saw that battle as a historic test for human intelligence.




Vishwanathan Anand faced Magnus Carlsen in 2013 FIDE World Chess Championship that is currently being held in Chennai, Tamil Nadu. *European Pressphoto Agency*

The outcome could be seen as an "early indication of how well our species might maintain its identity, let alone its superiority, in the years and centuries to come," wrote Steven Levy in a Newsweek cover story titled "The Brain's Last Stand."

But after Mr. Kasparov lost to Deep Blue in dramatic fashion, a funny thing happened: nothing. Amateurs didn't throw away their sets, and professionals didn't switch careers. In fact, just about the only people who quit chess after the match were the IBM computer scientists, who moved on to other challenges. Chess went back to the way it was before—with one big difference.

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Before the Deep Blue match, top players were using databases of games to prepare for tournaments. Computers could display games at high speed while the players searched for the patterns and weaknesses of their opponents. The programs could spot blunders, but they didn't understand chess well enough to offer much more than that.

Once laptops could routinely dispatch grandmasters, however, it became possible to integrate their analysis fully into other aspects of the game. Commentators at major tournaments now consult computers to check their judgment. Online, fans get excited when their own "engines" discover moves the players miss. And elite grandmasters use computers to test their opening plans and generate new ideas.

This wouldn't be very interesting if computers, with their ability to calculate millions of moves per second, were just correcting human blunders. But they are doing much more than that. When engines suggest surprising moves, or arrangements of pieces that look "ugly" to human sensibilities, they are often seeing more deeply into the game than their users. They are not perfect; sometimes long-term strategy still eludes them. But players have learned from computers that some kinds of chess positions are playable, or even advantageous, even though they might violate general principles. Having seen how machines go about attacking and especially defending, humans have become emboldened to try the same ideas.

Computers have gone so far that the top human players are now those who most often play the moves that would be chosen by the best engines (which sport names like Houdini, HIARCS and Rybka). Magnus Carlsen's biographers dub him the "hero of the computer era." Indeed, a study published on ChessBase.com earlier this year showed that in the tournament Mr. Carlsen won to qualify for the world championship match, he played more like a computer than any of his opponents.

The net effect of the gain in computer skill is thus, ironically, a gain in human skill. Humans—at least the best ones—are getting better at playing chess. And there are far more top players than ever before. Today there are about 1,500 grandmasters, more than twice as many as in 1997, and they come from over 80 countries. Twenty-two of them earned the title before reaching the age of 15.

When the first international rating list was published in 1971, the only player rated over 2,700 was Bobby Fischer. (In chess ratings, a 100-point advantage corresponds to an almost two-thirds chance of winning a match.) Fischer went on to beat Boris Spassky in their celebrated 1972 world championship match. In 1974 there were two players with 2,700 ratings: Fischer and his successor Anatoly Karpov. Even by 1997 there were just eight.

Enthusiasts watched world chess champion Garry Kasparov on a TV monitor in 1997 as he struggles at the start of the final match against IBM's Deep Blue computer in New York. Mr. Kasparov lost. *Agence France-Presse/Getty Images*

Nowadays an entire website is dedicated to tracking the 50 or so players who on any given day are rated 2,700 or higher. On the eve of the current match, Mr. Carlsen was No. 1 with a rating of 2,870, the highest of all time. (Garry Kasparov, who retired in 2006, is the second-highest-rated ever; he was No. 1 in the world for nearly 20 straight years.)

Many chess fans and experts believe that ratings are higher today because of "inflation"—a generally higher drift caused by statistical quirks. Fischer is only No. 13 on the all-time ranking list, but he dominated his opposition more than Messrs. Kasparov or Carlsen. During his own qualifying matches, Fischer destroyed two of the world's top players by unheard of 6–0 scores. But the moves Fischer played may not have been any better than those of Messrs. Carlsen or Kasparov. Indeed, according to computer analysis, his moves were probably a bit worse. This doesn't diminish his achievements in any way; perhaps if Fischer had continued to play after 1972, or had the help of today's computers, his play would have become even stronger.

There is another reason today's elite chess players are probably better than their predecessors: Hardly a week goes by now without a top-level tournament. There is a World Cup of 128 players, a Grand Prix series of six tournaments and a number of independent events in traditional chess meccas like London, Moscow and the Netherlands, and in new ones like Beijing and St. Louis. More top-level experience means that there are more opportunities to learn from one's mistakes.

Chess is also more popular than ever before among children. The extravaganza known as the SuperNationals, which combines the kindergarten through high school championships of the U.S. into one quadrennial event held in Nashville, features over 5,300 competitors. The variety of chess apps for computers and mobile devices is tremendous, and schools increasingly include chess in the curriculum or as an enrichment program.

After Mr. Kasparov lost to Deep Blue, the Boston Herald's front page screamed "You Lose, Man!"

But the game of chess didn't lose a thing. As in other fields, human chess skill has been complemented and augmented, not replaced, by machines. The result has been new levels of understanding and popularity for one of the oldest human pastimes. The championship reign of Magnus Carlsen will bring to fruition this new era in chess.

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