

# Monroeville teen masters champion chess computer

By Douglas Heuck

For The Pittsburgh Press

Almost everything appeared to favor Vivek Rao, the 15-year-old Monroeville chess master, in the unusual match he was about to face.

After Vivek's performance last summer, chess watchers speculated he would be the next Bobby Fischer. The parallels exist.

Fischer, generally regarded as the greatest chess player in modern times, learned the game at 6, became a master at 12 and dethroned ex-Soviet Boris Spassky in 1972 for the world championship.

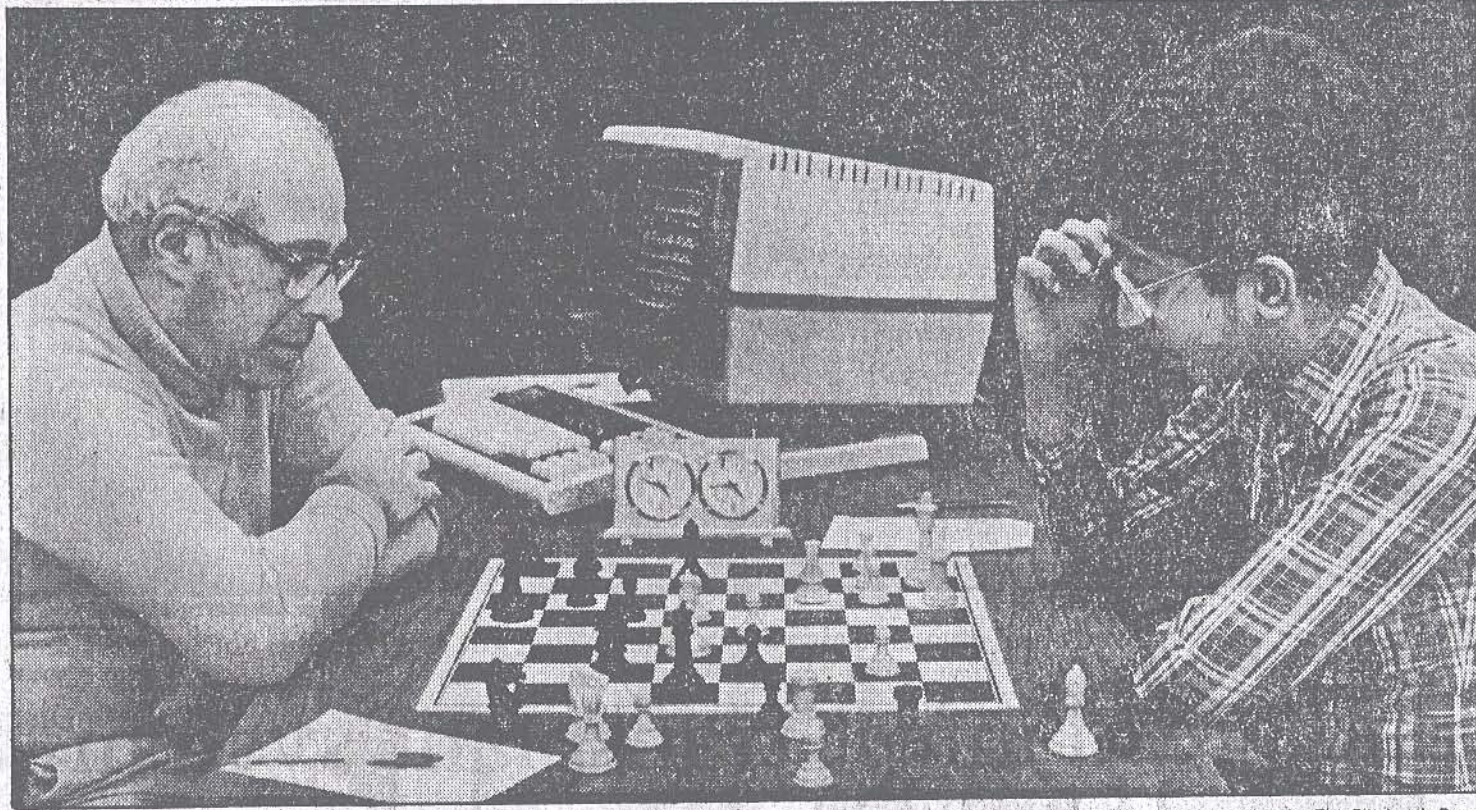
Vivek, a senior master, learned the game at 8, became a master at 13 and stunned the chess world July 31 by playing Spassky to a draw at age 14.

Only one pre-game advantage seemed to rest unquestionably with Vivek's opponent, a chess player who never feels intimidated, never feels the cold drop of sweat hit halfway down the rib cage, never feels regret.

Vivek's opponent was immune to such feelings because it is a machine, a Carnegie-Mellon University computer named Hitech. And if Vivek's rise in chess standings is astonishing, Hitech's is science fiction come true.

Since its first tournament May 25, the \$20,000 compilation of computer chips has shot high into the master category. On Oct. 15, through telephone hookups to Denver, Hitech beat a \$14 million machine called Cray Blitz for the North American computer-chess championship.

The chess brain behind the best computer player in the world is Hans Berliner, a 56-year-old computer-science professor at CMU. At corre-



Pete Diana for The Pittsburgh Press

While Vivek Rao, right, ponders move, professor Hans Berliner and Hitech wait to compute

spondence chess, Berliner is a former world champion.

"The quandary in designing a chess computer is it has a finite amount of time to make a move. In the past, a machine could either look at a few possible moves and do a great job of determining what each is worth. Or it could scan many possibilities with little intelligence."

He had designed chess programs before, but not until graduate student Carl Ebeling designed special silicon chips did the idea of a chess-playing computer appear to have long-term possibilities.

Ebeling's design allows each of 64 chips, one for each square of the board, to simultaneously search and judge which of thousands of possible moves is best for its square. In turn, a central arbiter works with "Oracle," the intelligence apparatus, to choose the best move.

The computer searches and superficially judges 200,000 possible moves in one second, 30 million possible positions in three minutes, or as Berliner said, "Hitech simply has instantaneous understanding of possible moves."

"Humans usually look at 20 to 30 possible moves, but they look at the few possibilities thoroughly," Berliner said, acknowledging that Hitech is not yet equal to humans in chess intelligence.

At 12:15 p.m. Oct. 26, in a match arranged by The Pittsburgh Press, Vivek sat down across from Berliner, who with assistant Gordon Goetsch would operate the machine. Over a room full of whispers at the Pittsburgh Chess Club in Squirrel Hill, Vivek asked "Are we ready?"

Berliner and Vivek shook hands, each set his side of the game clock and the game began.

Vivek abruptly advanced a white pawn. Immediately Berliner reported the move to Goetsch who typed it into the machine. The computer responded instantly, and Berliner moved a black pawn.

Hands banged pieces toward the middle of the board. Hands smacked the game clock. Hands scribbled moves on notebooks. Back and forth, black and white rapidly developed openings.

Then the pace slowed. Quiet hung in the room. Vivek sat, arms in his lap, and stared at the board. Motionlessly, he sat, only his eyes moving in quick little jerks.

He sat for minutes, and his game clock ticked.

Vivek made his move. He pushed down the button on his clock, starting Hitech's clock. Berliner read out the move and Goetsch typed it in. In less than four seconds, the computer

made its decision.

A faint electronic beep, and Berliner made the machine's 13th move — queen to rook 4. Berliner hit the clock, and it was Vivek's move again.

Vivek sat, searching. He raised his head and peered at Berliner, trying to gauge a reaction to the machine's last move. Berliner got up from the table, walked over to Ebeling and whispered something in his ear.

Vivek sat. He had taken almost 5 minutes more than the computer so far. Vivek appeared to be frozen. The less he moved, the quieter everyone became, until the sound of his ticking clock dominated the room.

Vivek's body rose and fell with his breaths until he finally made his 14th move. Hitech responded quickly.

This time, though, Vivek's large brown eyes looked around the room. On his face was a smile.

## The winning combination

Here are the moves in the match between Vivek Rao and Hitech.

White	Black
Rao	Hitech
1 P-Q4	P-Q4
2 P-QB4	PxP
3 N-KB3	N-KB3
4 P-K3	P-K3
5 BxP	P-B4
6 O-O	P-QR3
7 Q-K2	P-QN4
8 B-N3	B-N2
9 P-QR4	QN-Q2
10 PxNP	RPxP
11 RxR	QxR
12 N-B3	P-N5
13 N-QN5	Q-R4
14 P-K4	B-K2
15 P-K5	BxN
16 PxB	N-KN1
17 P-Q5	NxP
18 QxN	QxN
19 PxP	N-B3
20 R-K1	K-B1
21 PxP	Q-Q2
22 Q-N8 (ch)	Q-Q1
23 QxQ	BxQ
24 B-KB4	P-QB5
25 BxP	P-N4
26 BxP	K-N2
27 B-Q2	R-B1
28 BxP	Resigns

He made his 15th move, pushed back his chair and leaned back. Suddenly there was whispering again, and it grew louder.

"I think Vivek has done it!" said an elderly man to his friend.

Vivek got up and walked around the room, trying but failing to repress a wide grin.

"The computer's about lost right now. It shouldn't be very long now, I think I'm winning pretty clearly," Vivek said.

He went about the room talking. Now the computer ate up time.

At 1:50 p.m., the crowd surrounded the table. On Hitech's 28th move, Berliner turned over the computer's black king. Berliner and an elated Vivek shook hands, and the audience applauded for the young master.