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## **Crossword constructor builds a Super Bowl puzzle for The New York Times Magazine**

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*The Register-Guard*

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Eugene computer wizard Matt Ginsberg will enjoy his own moment of football glory today.

Ginsberg and fellow puzzle constructor Vic Fleming, who is in real life an Arkansas judge, co-created “Grid Irony,” the football-themed crossword puzzle that will appear in honor of Super Bowl Sunday in today’s New York Times Magazine.

“I can’t tell you a lot about it because I don’t want to ruin the puzzle for anybody,” Ginsberg says, noting that he himself is not a football fan. “If it were very dependent on football knowledge, then nobody would have a good time. Puzzles are no longer about arcana. You no longer have to know some sub genus of flowering plant that lives in Madagascar and nowhere else.”

Ginsberg, 53, is a computer programmer and entrepreneur who co-founded and is CEO of On Time Systems in Eugene. He is interested in complex artificial intelligence problems, such as working out the most efficient route for a jet plane to fly from one place to the next. (His program that does just that is in use by the U.S. Air Force.)

Conceptually, it turns out, getting a plane from Los Angeles to Hong Kong on the least amount of fuel is not wildly different from filling in interesting English words and phrases on a 15-by-15 grid.

Both undertakings are called “constraint satisfaction problems” and are attacked by a combination of special knowledge, inspired theory and brute-force computer work.

To solve the crossword version of the problem, Ginsberg created his own database of interesting English words and phrases that he has used with his own custom software for crossword construction.

“Interesting phrases” to a crossword constructor means something different than it does to the rest of us; an interesting phrase, for example, is “DVD player,” which is not

contained in most dictionaries but has the crossword puzzle virtue of starting with five consonants in a row.

To build his dictionary, Ginsberg started with a million-word list pulled together by scraping the Web, paying special attention to Wikipedia entries and popular Google search terms.

He then took 50,000 of those words and phrases and distributed them, 500 at a time, to each of 100 puzzle-addicted friends who volunteered to rate them for crossword interest.

“I built a statistical model that tried to predict the rating of those 50,000 words and then ran it on the rest of the million words to come up with my final list.”

The hundred volunteers each got a copy of the list in exchange for their services.

Ginsberg used his copy to try to crack a crossword barrier. Last year, the Times published a 15-by-15 puzzle with only 18 black squares — a record.

“The next thing, obviously, is 17 blacks,” Ginsberg says. “If you give that (problem) to any of the standard programs, they just crash.”

So Ginsberg wrote his own computer code and turned the program loose, with his new dictionary, to solve the 17-black problem. It ran for hours but gave up.

He is still tweaking the code and has an idea of making a more general crossword creation program, which he might publish, or might just keep for himself.

“If I succeed, it would give me a weird competitive advantage over other constructors,” he says.

Though he was interested, Ginsberg hasn’t entered the \$1 million Netflix Challenge, an open and as-yet-unsolved contest in which the Web-based movie rental company has offered a \$1 million prize to anyone who can improve their automated movie suggestions by 10 percent or more.

Crossword puzzle solving has generated an entire body of literature on the Web. The blog Rex Parker Does the NYT Crossword Puzzle ([rexwordpuzzle.blogspot.com](http://rexwordpuzzle.blogspot.com)), for example, reviews the New York Times puzzle daily.

Here’s what it had to say about Ginsberg’s puzzle in the Times on Dec. 8, a Tuesday:

“Twenty theme answers. Wow. And in a Tuesday puzzle. Wow. And the whole thing still manages to be almost a perfect Tuesday level of difficulty. Just wow. Unexpected, and a lot of fun.”

(Not that everything was perfect, in Rex Parker’s eyes. “What the !@\$@ was going on

in the SE corner?! Everything was cool and then [insert needle skipping/scratching sound effect here],” he wrote.)

Will Shortz, the cult-popular crossword editor for the Times (he was featured in the 2006 documentary film “Wordplay” and does the weekly puzzle segment on National Public Radio’s “Weekend Edition”), says he has enjoyed Ginsberg’s odd imagination in the more than half-dozen puzzles he has published during the past year.

“He likes novel things,” the puzzle master says. “Everything has some unusual twist. He’s also excellent at wide-open grids.”

Shortz says he especially enjoyed a film-themed puzzle written by Ginsberg that included four 14-letter film titles, each one consisting of two seven-letter words: “Blazing Saddles,” for example, or “Tequila Sunrise.”

“In each case, the answer spanned a black,” Shortz said.

While Shortz admires the technological innovations made by Ginsberg and other crossword constructors, he thinks there’s ultimately a limit to how few black squares can appear in a standard puzzle.

“Eighteen. That’s the record,” he said.

“It would be possible to make a puzzle that had fewer. But the vocabulary probably wouldn’t be up to snuff.”

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## **SUPER BOWL PUZZLE**

The New York Times Magazine is the only place you’ll find Matt Ginsberg’s Super Bowl puzzle today. Newspapers that purchase The New York Times Crossword through syndication, including The Register-Guard, will publish his puzzle next Sunday — one week after it appears in the Times.

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