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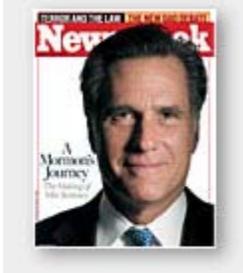
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The Element of Surprise

To help combat the terrorism threat, officials at Los Angeles Inter Airport are introducing a bold new idea into their arsenal: random of security checkpoints. Can game theory help keep us safe?

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WEB EXCLUSIVE

By **Andrew Murr**

Newsweek

Updated: 1:00 p.m. PT Sept 28, 2007

Sept. 28, 2007 - Security officials at Los Angeles International Airport now have a new weapon in their fight against terrorism: complete, baffling randomness. Anxious to thwart future terror attacks in the early stages while plotters are casing the airport, LAX security patrols have begun using a new software program called ARMOR, NEWSWEEK has learned, to make the placement of security checkpoints completely unpredictable. Now all airport security officials have to do is press a button labeled "Randomize," and they can throw a sort of digital cloak of invisibility over where they place the cops' antiterror checkpoints on any given day.



Security forces work the sidewalk

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Developed by computer scientists at the University of Southern California and believed to be the first program of its kind to be used at an airport, ARMOR aims to thwart terror plots during the early, surveillance phase. Typical plots start when would-be attackers begin watching their target "18 months to four years prior to an attack" to look for security weaknesses, says James Butts, deputy executive director of law enforcement at Los Angeles World Airports, which runs LAX and other city-owned airports. "Part of it is to look for patterns in the deployment of assets. We're trying to block the surveillance cycle" by making the security patrols appear in unpredictable places at unpredictable times.

Randomness isn't easy. Even when they want to be unpredictable, people follow patterns. "Unconsciously, (security forces) develop predictable patrol behaviors," as Butts says. That's why the new software helps, and the folks at LAX turned to the computer scientists at USC's Viterbi School of Engineering.

The ARMOR software is the real-world product of an idea that began as an academic question in game theory. USC doctoral student Praveen Paruchuri sought to find a way for one "agent" (or robot or company) to react to an adversary who has perfect information about the agent's decisions. Using artificial intelligence and

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game theory, Paruchuri wrote a new, fast set of algorithms to randomize the actions of the first agent. But when he took the paper to prestigious AI conferences, nobody would publish the work. The basic reaction: great math, but so what? "They said, 'We don't see a practical use for it'," says Milind Tambe, the USC engineering professor who led the ARMOR team. "It was very disappointing."

But LAX officials saw things differently. Under a mandate from L.A. Mayor Antonio Villaraigosa to improve airport security, they were on the lookout for new ideas. So when a former FBI agent named Erroll Southers, who works at a USC security program funded by the Department of Homeland Security, told LAX officials about it, they agreed to meet with the USC team in April. Over the summer grad students fed vast amounts of classified data about the airport's facilities into the program, and ARMOR started running in August, according to Butts.

The nation's fifth-biggest airport is "one of the top targets on the West Coast," says Butts. The "millennium plot" of December 31, 1999, aimed to set off explosives at LAX. Federal agents broke up the plot when they arrested Algerian Ahmed Ressaym entering the U.S. from Canada with a car laden with explosives. He was later convicted on terrorism charges. On July 4, 2002, an Egyptian immigrant named Hesham Hadayet opened fire at the El Al counter at LAX, killing two and wounding four.

Airport officials have at least one new task for the software. Soon ARMOR will begin jumbling the placement of the bomb-sniffing canine patrols too, says Butts. Other potential uses are too secret to talk about. Butts says that the new random placement "makes travelers safer" and even gives them "a greater feeling of police presence" by making the cops appear more numerous. That's good for visitors, and officials hope, bad for would-be terrorists.

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