

Researcher proposes statistical method to enhance airport secondary security screenings

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A researcher at The University of Texas at Austin has found that secondary security screening at airports is mathematically flawed, and has identified a way to select people for screenings more efficiently and fairly.

William H. Press, a professor of computer sciences and integrative biology, proposes a method called square root bias sampling to statistically choose who should be taken aside for a more thorough screening. The method applies to situations where selection is based on individual profiles such as ethnic or racial profiling.

His finding is published in the *Proceedings of the National Academy of Sciences*.

For the paper, Press supposes that whoever is doing the sampling has accurate statistical information that some people are more likely to be terrorists than others.

The statistical effectiveness of profiling selected groups has been relatively unexamined and Press said he does not think that it is effective.

Press's idea applies when there is a primary screening that is uniform, and then the possibility of a secondary screening based on an individual's "profile" (their "prior probability").

At an airport, the primary screening is everyone who shows up and goes through the checkpoint, while the secondary screening is when someone is selected for a more thorough search.

The way it works starts this way: Say that someone from the profiled group, Group P, is 16 times more likely to be a terrorist than someone from the average group, Group A.

Using the square root bias, people from Group P should be screened only four times more often than people in Group A (four is the square root of 16). That reduces the number of people from Group P who are subjected to repeated screenings, but it still screens people from Group P more than the average person.

Press said the method makes the best use of scarce resources to screen people while not screening the same people again and again, as happens now.

An astrophysicist-turned-computational biologist, Press was looking for a way to sample long sequences of DNA when he hit upon square root bias sampling as a solution.

After arriving at the method himself, he surveyed the literature and found that Ruben Abagyan, a professor at the Scripps Research Institute in La Jolla, Calif., had used a similar method in a different context.

Source: University of Texas at Austin

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