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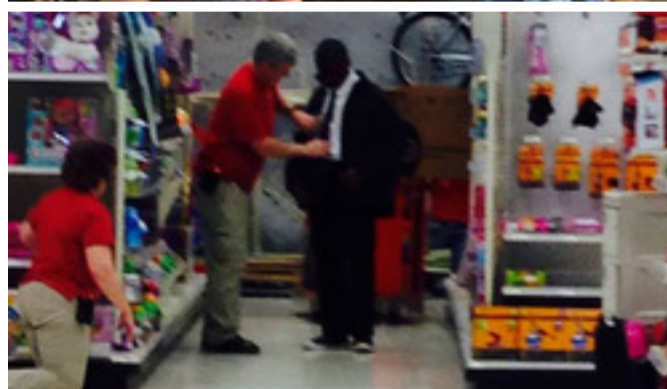
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How an algorithm could help spread HIV information among homeless teens

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IMAGE: FLICKR, [FRANCO FOLINI](#)

BY MATT PETRONZIO
2 DAYS AGO

"Algorithm" has become a dirty word. While many websites and social networks set up algorithms to anticipate and meet their users' needs, they also use them to manipulate our data for advertising, making money off every digital step we take.

But we can use algorithms for social good, too. Social workers and computer scientists at the University of Southern California (USC) are doing just that, using math and data to help prevent the spread of HIV among homeless teens.

SEE ALSO: [The trick is to treat homeless people like any other tenant](#)

Researchers at USC's School of Social Work and School of Engineering have developed a new algorithm called [PSINET](#). Through artificial intelligence, PSINET can help agencies identify the best person in a given homeless community to spread important HIV prevention information among youth, based on a mapped-out network of friendships.

These agencies traditionally rely on word of mouth, educating a select group of homeless teens to spread important information back to their friends. But due to so many uncertainties, this method is often met with limited success.

"There are certain at-risk populations, like homeless youth, where we want to do peer-led HIV prevention, but we don't really know what the networks look like," Eric Rice, assistant professor at USC's School of Social work and co-author of the paper on PSINET, told *Mashable*. "They're changing all the time, and there's a lack of information because there isn't the same stability that you get in, say, a classroom."

But

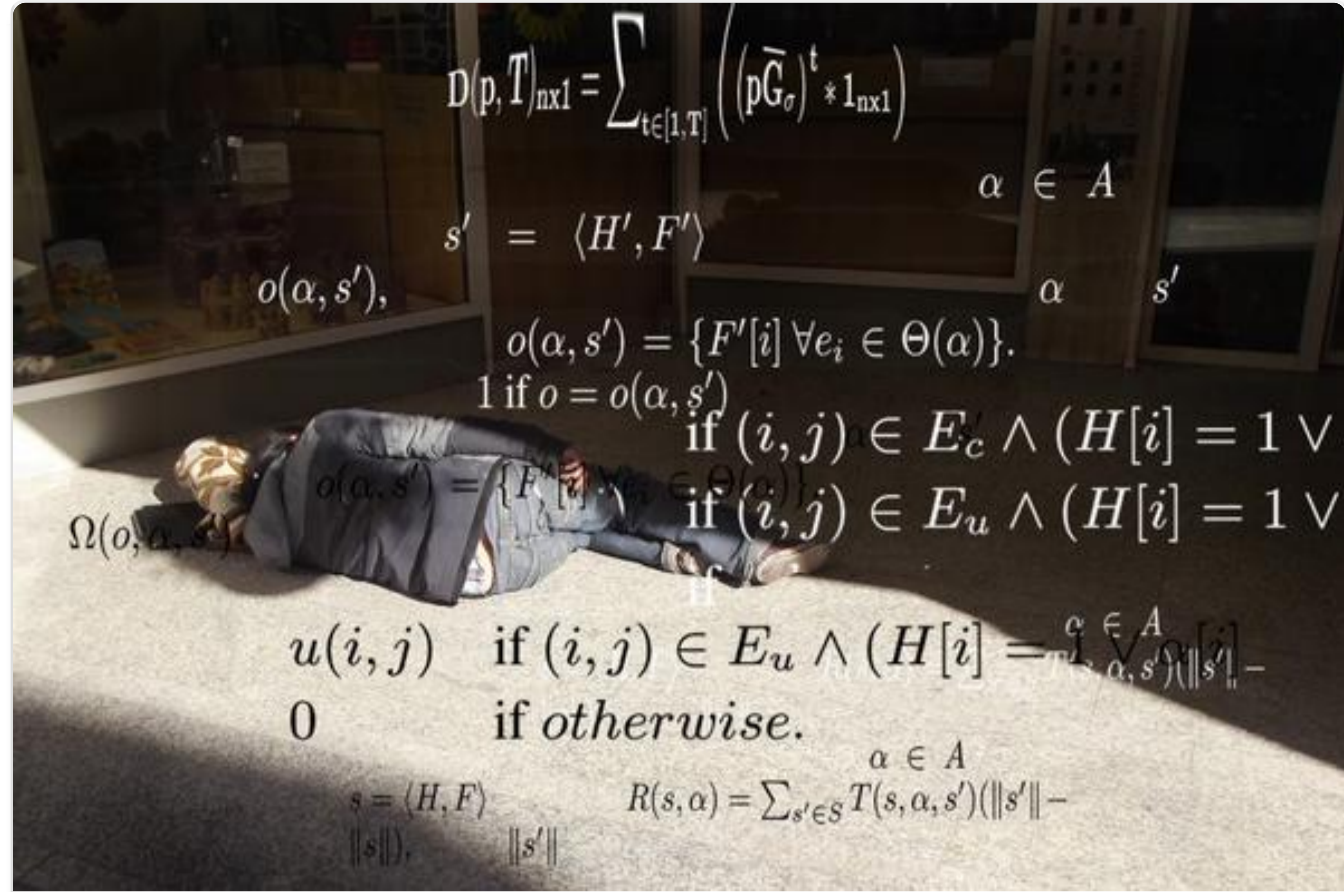
this algorithm results in 60% more information spread than through typical word-of-mouth campaigns, according to the researchers. It also accounts for uncertainties, and allows for the network to grow.

Here's how it works: The researchers mapped the friendships of homeless teens at [My Friend's Place](#), a local homeless agency in Los Angeles. Each person is represented by a node on the map, and links between them indicate friendships. The algorithm looks at this network, and runs through thousands of possibilities for the person with the greatest reach at a certain point in time, and selects a peer leader.

Then, social workers can teach basic information (e.g. such as the importance of wearing condoms, how and where to get tested for HIV, etc.) to the leader, and also get information from them about their network of friends to build on the program.

According to the researchers, homelessness affects about 2 million people between the ages of 13 and 24 every year in the United States — 11% of whom are HIV-positive (that's 10 times the rate of infection in the general population). Quickly spreading information among this demographic is a daunting task.

"It's a very complicated problem with a lot of uncertainty. But, instead of just taking the person with the most connections to other people, the algorithm is very aware of whom it picked previously, and so it helps you get into places where you haven't been yet. You're not just using overly simple decision rules," Rice said.



USC @USC Follow

To prevent the spread of HIV among the homeless, USC researchers turn to math: ow.ly/lvmnB

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The project is a combination of computational muscle and real-world understanding of the homeless youth population. However, it's still in its early stages, and hasn't been used in the field yet. "This is step one in the process. We've just developed an algorithm that outperforms other simpler decision rules. But it's an exciting direction to go in, and something really novel to be thinking about," Rice said.

The researchers are currently working with agency partners, particularly My Friend's Place, to develop an easy-to-use interface for the algorithm. They hope to implement it in a real-world setting this year, possibly even by the summer.

While the focus right now is on homeless youth, Rice hopes that in the future, the algorithm can have a positive impact in other fields that require the efficient spread of information throughout a network. "This is a really promising technological solution to help us do what we do in social work and public health better," he said.

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