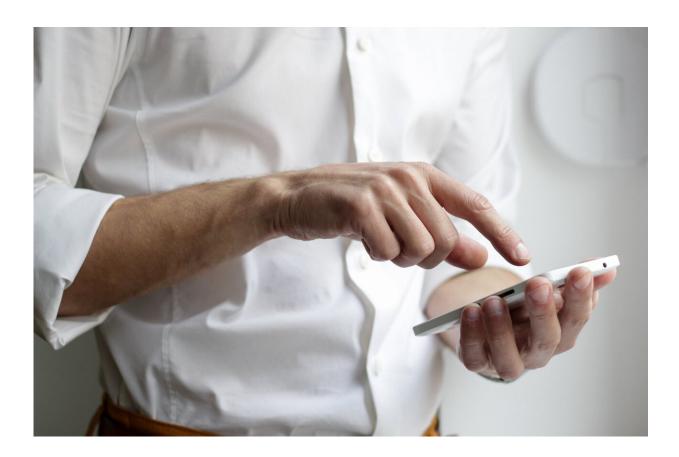# Researchers sharpen Cupid's aim on dating apps with new algorithm

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Credit: Unsplash/CC0 Public Domain

A new algorithm proposed by a University of Texas at Dallas researcher and his colleagues could help dating app users find the perfect mate.

In a study published online April 7 in the journal *Manufacturing & Service Operations Management*, corresponding author Dr. Ignacio Rios, assistant professor of operations management in the Naveen Jindal School of Management, and co-authors explored a central problem faced by online dating companies.

"One of the biggest issues is how to decide which profiles to show to each user in order to ensure that they will get meaningful matches," Rios said. "In many dating apps, we see a lot of frustrated users because they struggle to find a match that leads to a longer-term relationship. This is partly because of inefficiencies in how these apps work."

The $12 billion online dating industry includes hundreds of services. In the past two decades, online dating platforms have become one of the most common channels for couples to meet. Previous research found that nearly 40% of couples who met in the U.S. in 2017 did so online.

During the COVID-19 pandemic, the use of online dating platforms experienced massive growth because of lockdowns and concerns about spreading the virus, Rios said.

How they work

Many dating apps limit the number of profiles a user can see each day. Some platforms, including Tinder and Bumble, implement this by imposing swipe limits, while others, such as Hinge, limit the number of likes.

As a result, one of the primary roles of the platforms is to select a daily set of profiles to display to each user based on the preferences and characteristics of those involved.

In September 2018, the researchers collaborated with a major U.S.

online dating company to study how its [platform](#) should select the set of potential partners to show each user in order to maximize the expected number of matches.

The platform has about 800,000 active users in more than 150 geographical markets and uses the same algorithm in all markets. Users can declare a preferred age range, height range, maximum distance from their location and more. Using this data, the platform computes a set of potential partners for each user.

A new method

Rios and his colleagues developed a model that incorporates a novel component: users' experiences.

Using the industry partner's data, the researchers studied users' preferences, such as age, religion and race, and behavior, such as whether each user logged in, and, if so, how they evaluated the profiles shown to them.

The study found that the more matches a person has had in the recent past, the fewer likes they give to other profiles. This suggests a history effect, Rios said.

Estimates show that each additional match reduced the probability of a new like by at least 3%.

"We observed that users are less likely to like other profiles when they have recently succeeded in obtaining more matches," he said. "This might be because users keep in mind the amount of time and energy they can spend in the app, and thus if they had many matches in the recent past, they expect to spend their time on those matches instead of liking other profiles.

"Another likely reason is that users update their beliefs about their own attractiveness, and thus become pickier. Finally, a third possible reason is that users have faith that their new matches will work out, so they avoid liking new profiles."

The researchers incorporated these findings into a [new algorithm](#) to solve the platform's problem. Rios said the algorithm considers the probability that both sides will like each other and prioritizes the users who have not obtained matches in the recent past, with the assumption that they will be more likely to like the profiles shown to them.

Results and implications

Using simulations on real data, the researchers found that the proposed algorithm improved the overall match rate between 20% and 45% relative to the industry partner's current algorithm. Those results persuaded the company to test the algorithm in practice.

In field experiments in the Houston and Austin markets in August 2020, the researchers' algorithm yielded at least 27% more matches than the company's algorithm.

Rios said the results highlight the importance of correctly accounting for the preferences, behavior and activity metrics of users to improve the operational efficiency of matching platforms.

"The implication is that users will get more matches and potentially find a long-term partner," Rios said. "From the app's perspective, generating more matches is one of the [key performance indicators](#), and it is closely related with engagement, retention, growth and other relevant outcomes.

"The methodology can be applied to any dating app that offers a limited set of profiles each day. Other companies could use our framework to

increase the number of matches they generate."

The industry partner recently expanded the use of the proposed [algorithm](#) into additional markets, Rios said. The results were similar.

Next, the platform will implement the framework in its largest markets.

Provided by University of Texas at Dallas