

# Researchers study nuances of social media 'likes'

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The simple act of pressing a "like" button on a social media site can speak volumes about a user's preferences, relationships and behavioral patterns, according to Penn State researchers, and such findings about a user could help improve and personalize services. The ultimate goal of their multi-year project, [LIKEs-R-US](#), is to leverage the data they have collected into developing enhanced technologies that assist users in their social networking and online activities.

"The goal is to look at really diverse 'like' activities across multiple social networks and understand how [likes](#) are made in general," said Dongwon Lee, an associate professor of Information Sciences and Technology (IST) who is currently on assignment with the National Science Foundation (NSF) as a rotating program director.

Lee's collaborators on the project include Jin Yea Jang, a master's degree candidate at the College of IST; Kyungsik Han, a research scientist at Pacific Northwest National Laboratory who received his doctoral degree from the College of IST in 2015; and Jongwuk Lee, an assistant professor at Hankuk University of Foreign Studies in Korea, who worked with Lee as a postdoctoral scholar at IST.

According to Lee, the original project began in 2014 as part of an IST seed project in which the researchers were awarded a \$10,000 internal grant to explore research ideas. Subsequently, Lee secured further grants from the NSF and Samsung to support the project. Their research led to numerous research articles that have addressed different aspects of

social media with respect to "liking:" for example, the differences between how teens and adults use "likes" in Instagram, the dynamics of "like"-based networks, and how to unearth latent "like" patterns from a user's past purchase log to improve recommendations.

"How are 'like' activities being made?" Lee said. "Can we understand different user behaviors from the lens of 'like?' Is it just friends and family members who like your Instagram photos, or strangers?"

Using computational and data-driven methods to collect, pre-process, and analyze data from millions of social users, Lee and his colleagues are attempting to answer such questions.

Lee and his colleagues based the majority of their studies on Instagram, an online mobile photo-sharing, video-sharing, and [social networking](#) service that enables its users to take pictures and videos and share them either publicly or privately on the app, as well as through a variety of other social networking platforms. In addition to being one of the most popular social networking sites, Instagram users show high engagement, as 59 percent of them are on the platform daily.

The results of the researchers' initial studies indicate that teens and adults differ in their Instagram "like" patterns and how they use the social network. Teens assign more likes and comments and use keywords more often than adults. Teens also receive more likes and self-comments per photo, and tend to reply to others' comments quicker than adults. In addition, Lee said, the popularity contests that many teens participate in carry over into the digital world.

Teens initially post a lot of photos but delete photos quickly if they do not receive a lot of likes. Compared to adults, Lee said, teens "monitor more closely how many likes they're getting." On the other hand, Lee said, one surprising finding was that adults post more photos overall to

Instagram than teens.

Another discovery that Lee and his collaborators made was that more than half of likes on Instagram photos come from relative strangers rather than friends or family members. The researchers also found a positive correlation between the number of likes a user receives and the number of photos a user posts or the number of people who follow the user. More followers translate to more likes; however, interestingly, the number of people a user follows has no impact on the number of likes he or she receives.

The researchers' studies could lead to several opportunities to improve existing recommendation technologies, Lee said. First, social networking sites could provide users with a summary of their activities (e.g. how many photos they have posted, likes or comments they have added or received, what the topics of their photos are, etc.). With these reports, users will be aware of and able to reflect on their activities. Also, social networking sites could use summary items to recommend topics with similar interests or users who have shown similar behavioral activities.

In addition, Lee said, the "like" technology could be applied to recommendation technologies in other domains, such as online retail companies. Existing recommendation techniques such as collaborative filtering, solely use past purchases and rating information to suggest individualized products to users. However, Lee said, if a user's purchase and rating pattern is sparse, he or she will not receive much feedback from the system. By exploiting "like" information, researchers could do more fine-grained analysis that would enable online retailers such as Amazon to more effectively promote its products. For instance, Lee and his colleagues recently invented a technique to automatically unearth hidden "disliking" patterns of individual users by observing purchase and rating information, and exploit them for improving recommendation accuracy.

Provided by Pennsylvania State University

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