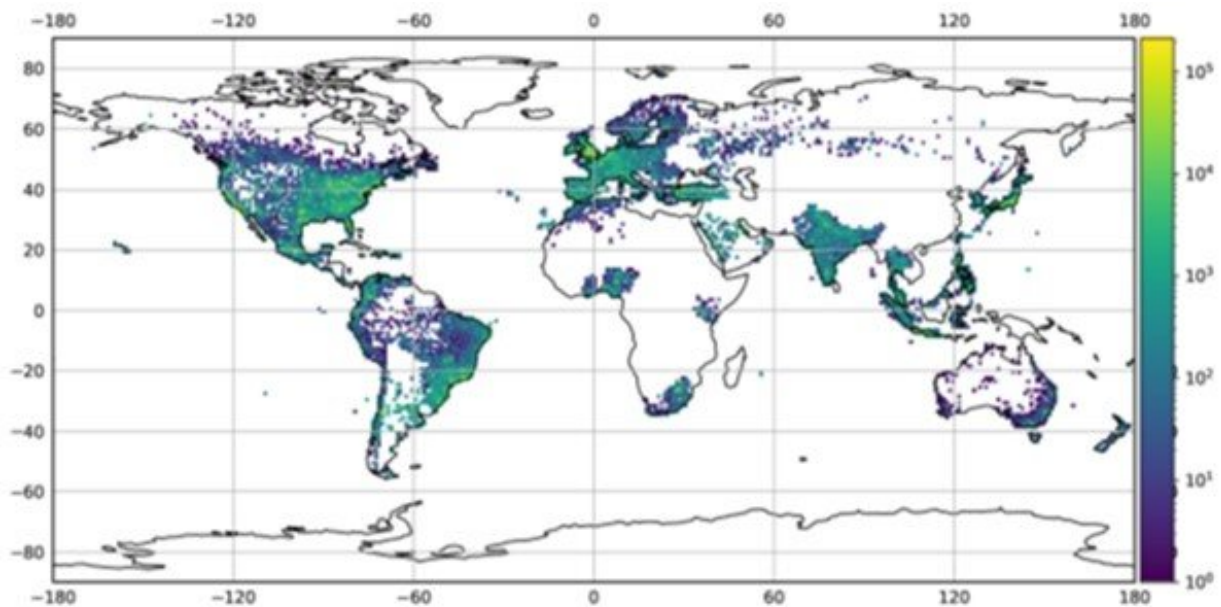


# Using big data to explore the principles of people's online activities globally

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The global action area map shows geographical disparities in the use of social media despite worldwide utilization. Credit: Toyohashi University of Technology.

A research team led by Shiori Hironaka, a project assistant professor of Computer Science and Engineering at Toyohashi University of Technology, collected big data on social media in ten countries and analyzed the relationship between connections and the behaviors of people on the Internet. The researchers found that the users had the same

characteristics in follow ratios, which reflect the behaviors of users regardless of country. Discovering common characteristics and differences in data that reflects social diversity may help people effectively use data according to their cultural differences, for instance, for marketing and the effective sharing of information.

The team collected data on the activities of more than 4,000,000 Twitter users in ten countries (Japan, the U.S.A., Brazil, the U.K., Philippines, Turkey, Indonesia, India, Mexico, and Saudi Arabia) and statistically analyzed the online relationships between the connections and behaviors of users. This is the first analysis of this type of data in the world.

The use of social [media](#) data for a diverse array of surveys and analyses is becoming more prevalent as more people use social media. This is because social media data is seen as an indirect observation of social situations. However, the nature of the data varies by country due to cultural differences and other factors, even though the data is similarly observed on social media. User behaviors are believed to reflect the cyberculture of the group the user belongs to. Therefore, it is important to know properties of social media in order to use them in various surveys.

The team analyzed the connections between users, focusing on the nearness of the areas where they act. Because the purposes for using social media may be closely connected with the nearness of the action areas of the users who are connected via social media. To be specific, action areas tend to be close if a social media service is used for exchanges with friends. If the purpose is reading celebrities' posts or news, the nearness of action areas does not matter. Having examined the relationship between the nearness of action areas and user behaviors on social media, we compared the characteristics of different countries.

As a result, we identified ten countries with common points regarding

user characteristics related to the nearness of action areas. One characteristic is the follow ratio. It is the ratio of those a user is following to the followers of the user. If the follow ratio is high, it is believed that a user is accessed by people wishing to read the user's posts. We also found that the users with longer profiles tend to be farther from the action areas of the connected users. However, the ten countries do not necessarily have this in common.

Essentially, data on [social media](#) connections can express information about users around the world in the same way. However, this may not ensure the expected precision for such functions as friend recommendations and attribute estimations as the nature of the data individually differs due to [cultural differences](#). The identified characteristics are expected to help provide the best information to [users](#) of different countries and cultures.

The study was published in *IEEE Access*.

**More information:** Shiori Hironaka et al, Cross-Country Analysis of User Profiles for Graph-based Location Estimation, *IEEE Access* (2021). [DOI: 10.1109/ACCESS.2021.3086523](https://doi.org/10.1109/ACCESS.2021.3086523)

Provided by Toyohashi University of Technology

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