Bluetooth technology ideal for detecting COVID-19 cases through smartphone contact tracing

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The key is the high level of precision, higher than other technologies, such as GPS, cell phone networks and Wi-Fi. Credit: @UPV

A study carried out by researchers at the Universitat Politècnica de València (UPV) and published in *IEEE Access* concludes that Bluetooth technology is ideal for detecting possible COVID-19 cases through smartphone contact tracing. The key is the higher precision by comparison with other technologies such as GPS, cell phone networks and Wi-Fi.

"Tracers have been and are essential to manage the pandemic. Today, the tracing is done by hand and this work is slow and inaccurate. However, as we have seen, technology can be highly useful: Contact tracing with smartphones and smartclocks can determine who has been in contact with an infected person, thanks to the use of localization and communication technologies such as GPS, cell phone networks, Wi-Fi and Bluetooth," explains Enrique Hernández Orallo, researcher at the Networking Research Group-DISCA of the Universitat Politècnica de València.

In their study, UPV researchers assessed the effectiveness of each one of these technologies. They designed an epidemiological mathematical model which allowed them to study its efficiency and impact as a measure of the number of persons directed to self-quarantine based on the results. "Bluetooth is the most suitable technology because it allows tracers to detect contacts within a range of two to three meters. Those contacts are considered by epidemiological models as a contact capable of passing the infection. Therefore, it helps to reduce the number of false contacts, and also allows them to be more efficient when establishing which people must self-quarantine," explains Enrique Hernández Orallo.

"Extremely useful" in a possible new outbreak

Since the infection rate of COVID is extremely high, the contact-tracing technology must be accurate and search quickly. However, a significant percentage of the population must install the contact tracing application on their smart devices for such a system to be effective.

"These strict requirements make contact tracing based on smartphones quite inefficient to contain the infection propagation during the first outbreak of the virus. However, in the case of a new outbreak of the pandemic, with a percentage of the population immune, or in combination with other less strict measures that reduce the spread of the virus (such as social distancing), contact tracing based on smartphones could be extremely useful, even if only a part of the population—less than 60%—are willing to use it. In any case, Bluetooth will be the most suitable tool to do the tracing," concludes Enrique Hernández-Orallo.

More information: Enrique Hernandez-Orallo et al, Evaluating How Smartphone Contact Tracing

Technology Can Reduce the Spread of Infectious Diseases: The Case of COVID-19, *IEEE Access* (2020). DOI: 10.1109/ACCESS.2020.2998042