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iPhone vs COVID-19

Can iPhones be the solution to coronavirus?

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Apple and Google are collaborating to create a contact tracing system as a means of reducing the spread of COVID-19 by using **Bluetooth Low Energy (BLE) technology.** Where there is a phone tracking, controversy about breach of privacy comes hand in hand. However, they have confirmed that this system won't be tracking user locations or collecting any data that would be stored into their server. Although this venture is pursued by Apple, Google is making it available to devices running Android 6.0 or higher, the update will run through Google Play. This venture is their attempt to make a framework which can then be outsourced to make an app as the final product.

As mentioned, a strong pillar in this ambitious project will be the use of BLE, which was developed by Bluetooth Special Interest Group for **short-range communication.** It acts an alternative to standard Bluetooth by having shorter bursts of connectivity instead of the constantly transmitting connection like you would for headphones or smartwatches. Whereas BLE activates for a limited time for periodic data transfers, thus saving a significant amount of battery. It's also, very similar to Wi-Fi as it allows devices to communicate with each other but is preferred to be used when battery life is of higher priority.

The main advantage of using BLE for COVID-19 tracing is that it is supported by almost every smartphone, ranging from cheap Android phones to expensive iPhones. As coronavirus is a threat to everyone, it is important that maximum number of people have access to these apps. The fact that it works will low power levels so to not impact battery life is an added bonus. Another incentive is that it doesn't rely on external networks alike GPS, Wi-Fi, or cellular data.

The range of wireless devices is dependant on few factors (e.g. operating environment, antenna design, device orientation, etc.), BLE is focused on very short-range and isn't the most accurate at calculating the exact physical location. However, it is possible for BLE devices to transmit data from 30 metres away, it comes at the cost of battery life and in regard to the

spread of coronavirus it is unnecessary for long distance transmissions. Another disadvantage is the issue of more obstructions/interferences (backpacks, walls, etc.) the worse the signal strength will be at accurately tracking the distance. However, once again for COVID-19 purposes, this limitation is favourable since the virus cannot be travel through walls or windows. Hence, BLE working best in open air areas is useful.

Now that the premise is set, we can get into the technicalities of this system. **iBeacon or beacon** (can be used interchangeably), is an Apple created software which allows iOS and Android devices to scan and display BLE signals from beacons. It functions by **transmitting unique codes** to its respective system or app, it can communicate physical locations, check-in on social media, etc. Another approach Apple and Google have explored is virtual BLE, which is a beacon point that is attached to an existing Wi-Fi network. This option is preferred for indoor navigation.

BLE technology in iPhones and android phones has paved the path to the creation of applications that can reduce the spread of a global pandemic. Apple and Google strive to create a framework that is effective yet doesn't breach the privacy of its users.

Device	Models with BLE support
iPhone	iPhone 4 and newer
iPad	iPad 3rd generation and newer
iPod touch	iPod touch 5th generation and newer
Android phones and tablets	All Android phones with 4.3 and newer

Almost all phones and tablets since 2012 have BLE, some Android devices might only support a version of Bluetooth. The table below outlines which devices have BLE.

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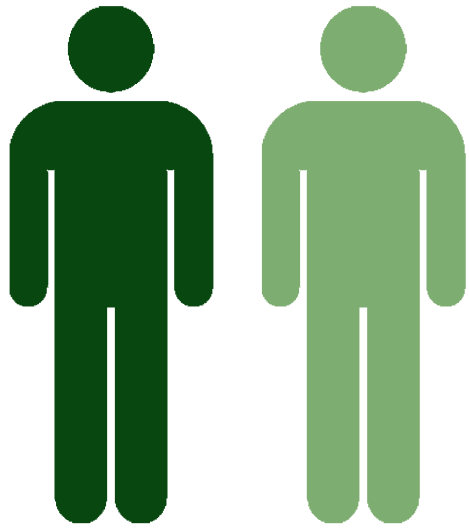
Two people stand close
to one another.
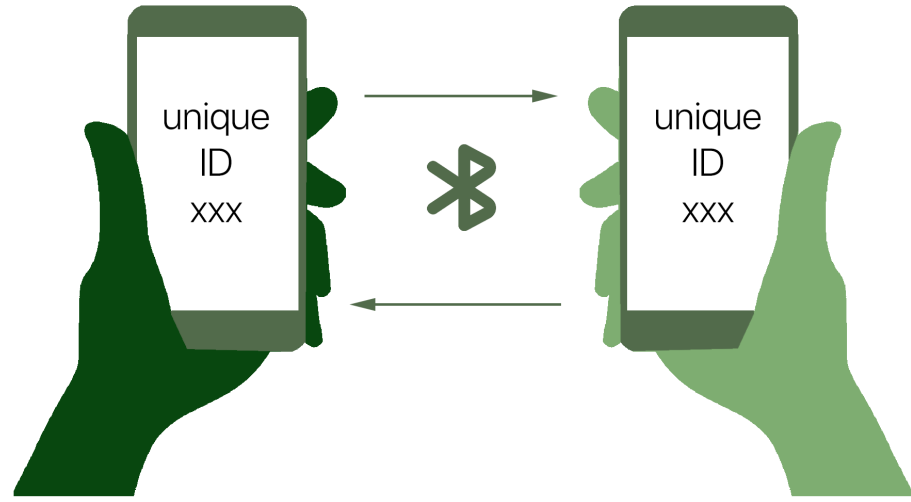
Using BLE and beacon signals their
phones communicate a unique ID to each other.

BLE beacon searches for other beacons that
have been nearby to notify them that they
were in contact with someone with
someone tested positive for coronavirus.

searching beacons
for phones that have
been in close range

After finding the other beacons,
the people get notified and can take
the necessary steps to get tested.