

# Lincoln Lab Designs COVID-19 Contact Tracing System

Lincoln Lab



To better see who an individual interacted with and where they were before a COVID-19 diagnosis, a team of researchers from MIT and Lincoln Laboratory led institutional partners in developing a digital "contact tracing" app that users can download.

“ The system traces an individual’s movement patterns leading up to a positive COVID-19 diagnosis using short-range Bluetooth signals, or “chirps.”

Nearby smartphones are able to detect these signals, allowing users to determine if they crossed paths with an infected person, while maintaining individual privacy. This system augments “manual” contact tracing done by public health officials.

MIT has committed to releasing developed software under open source so these tools and technologies can be openly disseminated and rapidly adopted for the greater public benefit.

This broad set of mobile apps is under development by a team led by Ramesh Raskar of the MIT Media Lab. This approach to private, automated contact tracing will be available in several ways, including through the privacy-first effort launched at MIT in response to Covid-19 called SafePaths, which has benefitted the design of the Bluetooth-based system.

“‘Find My’ inspired this system. If my phone is lost, it can start broadcasting a Bluetooth signal that’s just a random number; it’s like being in the middle of the ocean and waving a light. If someone walks by with Bluetooth enabled, their phone doesn’t know anything about me; it will just tell Apple, ‘Hey, I saw this light,’” says Marc Zissman, the associate head of MIT Lincoln Laboratory’s Cyber Security and Information Science Division, and co-principal investigator of the project.

After a positive COVID diagnosis, a person would receive a QR code from a health official. Scanning the code through the app will upload their signal log. Anyone with the app could then initiate their phones to scan uploaded logs from those who've tested positive. If there's a match, a notification would tell a user how long they were near an infected person and the approximate distance. It will include information from public health authorities on next steps. The entire process uses cryptographic techniques to maintain the privacy of those Covid-19 positive and those checking if they have been exposed.

The ability to conduct contact tracing quickly and at a large scale can be effective not only in flattening the curve of the outbreak, but also for enabling people to safely enter public life once a community is on the downward side of the curve.

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