



PACT: Private Automated Contact Tracing

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YouTube Video Animation: <https://www.youtube.com/watch?v=yuXzAh4sINw>

Rapid, accurate contact tracing is critical to containing the COVID-19 pandemic, and this approach has been deployed effectively in many other countries (e.g., China, South Korea, Singapore, etc.) Different approaches have been applied in different countries, e.g. some require citizens to manually enter their contact and physical location information, whereas others require automatically tracking movement of citizens using law enforcement monitoring authorities. Within the United States, personal privacy is a bedrock value. An automated approach that permits effective contact tracing while absolutely preserving privacy would mean that it would not be necessary to trade privacy for public health.

MIT Institute Professor Ron Rivest is leading an open collaboration, led by MIT researchers, of experts from many institutions and many fields of endeavor, all working together to defeat the coronavirus by automating contact tracing. Their approach uses inter-phone Bluetooth communications (including energy measurements) as a proxy for inter-person distance measurement. Through applied cryptography this system can be used to collect and maintain weeks of contact

events that can later be enriched by infection notifications (as specific individuals test positive) leading to exposure notifications to all cell phone owners who have had medically-significant contact (in terms of distance and time) with infected people in the past medically-significant time period (e.g., two weeks). All of this can be done without revealing any private information to anyone (not to the government, the health care providers, the cellular service providers, etc.) It is strongly privacy preserving - this is a very significant claim, but it's made by a team of the world's top cryptographers.

MIT Lincoln Laboratory is leading the required system analysis, architecture engineering, Bluetooth phenomenology data collection, data analysis, prototype development, testing and technology transfer to industry to permit implementation of Rivest's concept at national scale right now. Prototypes and demos exist. The prototype system will need to be transferred to and supported by the large cellular manufacturers (Apple, Google, etc.). Technical and policy discussions with those companies are already underway.

- No personal location information shared
- All contact information anonymized
- Health authorities cannot see locations

