

Using WiFi Position System for Developing A Privacy-Preserving Contact Tracing System in University Campuses

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ABSTRACT

One of the crucial tools to control and fight epidemic disease outbreaks (such as the fast-growing COVID-19 pandemic) is contact tracing in public buildings (such as universities). A contact tracing system can identify and alarm potential individuals who had close contacts with confirmed cases so that they can voluntarily self-quarantine. The current automated contact tracing systems, which mainly use smartphone sensors (e.g., GPS, Bluetooth), have two main challenges (1) protecting the privacy of the users; and (2) relying on GPS sensor, which does not work well indoors and in many urban settings. On the other hand, WiFi positioning systems have been considered one of the most used technologies for creating a real-time indoor positioning system (IPS), especially in university campuses where the required infrastructures usually exist. This study aims to study the feasibility of using WiFi location tracking technology to develop a conceptual privacy-preserving contact tracing system in university campuses. Such a contact tracing system relies on smartphones connected to the central WIFI system's access points and the connected devices Mac addresses to inform at-risk users. This study performs a comprehensive literature review to study the applicability, current limitations, and future research directions of such technologies for contact tracing. Such technology could enhance the current automated contact tracing system in universities by illuminating the need to use cellphones' applications while protecting users' privacy.