

Abstract: The usage of mobile devices is rapidly growing with Android being the most prevalent mobile operating system. Thanks to the vast variety of mobile applications, users are preferring smartphones over desktops for day to day tasks like Internet surfing. Consequently, smartphones store a plenitude of sensitive data. This data together with the high values of smartphones make them an attractive target for device/data theft (thieves/malicious applications). Unfortunately, state-of-the-art anti-theft solutions do not work if they do not have an active network connection, e.g., if the SIM card was removed from the device. In the majority of these cases, device owners permanently lose their smartphone together with their personal data, which is even worse. Apart from that malevolent applications perform malicious activities to steal sensitive information from smartphones. Recent research considered static program analysis to detect dangerous data leaks. These analyses work well for data leaks due to inter-component communication, but suffer from shortcomings for inter-app communication with respect to precision, soundness, and scalability. In this talk, I will address to the following research questions: *RQ1:* How to protect user's privacy/data against physical device loss/theft? *RQ2:* How to protect user's privacy/data against (un)intentional application leaks? In particular, I will present three novel frameworks: (1) ThiefTrap, an anti-theft framework for Android, (2) IIFA, a modular inter-app intent information flow analysis of Android applications, and (3) PIAAnalyzer, a precise approach for PendingIntent vulnerability analysis.

Brief Bio: I am a postdoctoral fellow at Software Engineering Group, University of Potsdam, Germany. I completed my PhD in June 2019 from the University of Potsdam. My broad research area is Program analysis and my PhD work focused on enhancing users' privacy on Android using program analysis techniques. Prior to this, I completed my Masters in Computer Science from Saarland University, Germany, and Bachelors in Information Technology from SASTRA University, India. In between, I worked as a software developer at Samsung Lab, Noida, and Aricent Group, Gurugram, India.