UNIVERSITY OF SOUTH FLORIDA

Defense of a Doctoral Dissertation

Algorithms to Profile Driver Behavior from Zero-permission Embedded Sensors
by

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In this dissertation, we design algorithms to profile driver behavior from zero-permission sensors embedded in modern smartphones and wearables. In order to profile driving behavior, we devised algorithms for detecting distraction while driving due to the use of modern-day smartphones (e.g., calling, texting and reading while driving) in real-time. We explore the feasibility of leveraging the accelerometer and gyroscope sensors in modern smartphones and wearables to detect instances of distracting driving activities. Our system using an accelerometer sensor signal of both smartphone and wearable produces the best results. We also explore location privacy breach by profiling subjects traveling in public transport. We also explore location privacy breaches via processing accelerometer and gyroscope sensors from wrist wearables towards profiling subjects traveling in public transport systems. We design a technique to process the wearable accelerometer and gyroscope sensor data in order to identify routes taken by humans as they travel in public buses across the city.

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