# UNIVERSITY OF SOUTH FLORIDA

## Defense of a Doctoral Dissertation

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

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For the Ph.D. degree in Computer Science and Engineering

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.

Examining Committee

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THE PUBLIC IS INVITED

## Publications

1) Kaoutar Ben Ahmed, Bharti Goel, Pratool Bharti, Sriram Chellappan, Mohammed Bouhorma, "Leveraging Smartphone Sensors to Detect Distracted Driving Activities" , In IEEE Transactions on Intelligent Transportation Systems (T-ITS), 2018, 1-10

2) Bharti Goel, Arup Kanti Dey and Sriram Chellappan, "Detecting Routes Taken by Users on Public Vehicle From their Wearables," In IEEE 8th Annual Information Technology, Electronics and Mobile Communication Conference (IEMCON), Vancouver, BC, 2017.

3) Bharti Goel, Arup Kanti Dey, P. Bharti, K. B. Ahmed and S. Chellappan, "Detecting Distracted Driving Using a Wrist–Worn Wearable," In 2018 IEEE International Conference on Pervasive Computing and Communications Workshops (PerCom Workshops), Athens, 2018, pp. 233–238

4) Bharti Goel and Sriram, Chellappan, "Distracted Driving Detection Integrating Accelerometer Sensors of Wearable and Smartphone", In review for Elsevier Pervasive and Mobile Computing

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