Accommodating User Diversity for In-Store Shopping Behavior Recognition

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ABSTRACT

This paper explores the possibility of using mobile sensing data to detect certain in-store shopping intentions or behaviours of shoppers. We propose a person-independent activity recognition technique called CROSDAC1, which captures the diversity in the manifestation of such intentions or behaviours in a heterogeneous set of users in a data-driven manner via a 2-stage clustering-cum-classification technique. Using smartphone based sensor data (accelerometer, compass and Wi-Fi) from a directed, but real-life study involving 86 shopping episodes from 30 users in a mall’s food court, we show that CROSDAC’s mobile sensing-based approach can offer reasonably high accuracy (77.6% for a 2-class identification problem) and outperforms the traditional community-driven approaches that unquestioningly segment users on the basis of underlying demographic or lifestyle attributes.