

Smart Transportation for Smart Cities

CTiCPS 2020 ML4CPS Keynote

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Abstract

We look at the problem of using the accelerometer in smartphones to detect mobility activities of commuters using the metro trains. We focus on typical movements, such as traveling, climbing the stairs or moving in the lift, waiting at the security, waiting at the turnstile to check out, and waking on the platform while waiting for a train. While solving the problem, we tackle the challenges of data imbalance and non-trivial decision boundaries among the classes of interest. We find that ECDF-based features perform better than the statistical ones for the binary classification of traveling and not traveling. Our study of metro travel finds its applications in the area of smart city analytics, for instance, our solution could be used to estimate rush at the metro stations. In the long run, it can also be used to enhance navigation services to account for delays at the metro stations into their algorithms.

Keywords: cyber physical systems, mobile computing, human activities, machine learning, deep learning
