

Mobile Demand Profiling for Cellular Cognitive Networking

In the next few years, mobile networks will undergo significant evolutions in order to accommodate the ever-growing load generated by increasingly pervasive smartphones and connected objects. Among those evolutions, cognitive networking upholds a more dynamic management of network resources that adapts to the significant spatiotemporal fluctuations of the mobile demand. Cognitive networking techniques root in the capability of mining large amounts of mobile traffic data collected in the network, so as to understand the current resource utilization in an automated manner. In this paper, we take a first step towards cellular cognitive networks by proposing a framework that analyzes mobile operator data, builds profiles of the typical demand, and identifies unusual situations in network-wide usages. We evaluate our framework on two real-world mobile traffic datasets, and show how it extracts from these a limited number of meaningful mobile demand profiles. In addition, the proposed framework singles out a large number of outlying behaviors in both case studies, which are mapped to social events or technical issues in the network.