Human mobility predictability: characteristics and prediction algorithms

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Abstract - Human mobility has gained much attention lately, due to its interesting applications in fields like urban planning, traffic forecasting, resource management in wireless networks or pervasive computing, among others. The main factor driving the research on this topic comes from the fact that mobile devices have made possible to gather the routes followed by a vast amount of users. Therefore, we can rely on extensive databases that contain mobility information of hundreds or even thousands of people. Recent studies have revealed that human mobility is highly predictable, which means that a person's whereabouts could be accurately predicted. However, such high predictability is just a limit to reach by now, but there are no clues yet on the algorithm that can achieve such accurate predictions. Nonetheless, since people's movement features are the ones showing the high predictability, could not we leverage those features in order to improve the prediction algorithms? In this talk we will go through from the basics, looking at how to capture human mobility using mobile phones, to most specific issues concerning the features that define how a person moves. Finally, we will discuss some ideas on how to leverage those features to improve existing prediction algorithms.

Brief Bio - Alicia Rodriguez-Carrion is a teaching assistan at the Department of Telematic Engineering of the University Carlos III of Madrid, where she received her M.Sc. degree in Telematic Engineering in 2010. Her current research is focused on how to use data collected by mobile devices to estimate future actions of a user, specifically leveraging information on users' mobility patterns to predict their next location in the near future. This general goal leads to dig deeper into human mobility analysis, prediction algorithms (such as Markov or LZ-based algorithms), location technologies (GPS, or wireless networks-based ones), or coping with the limitations of mobile devices (in terms of CPU, memory, energy or operating systems APIs).