



**Título: Online Clustering of Trajectory Data Stream**

**Data: 20/10/2016 Horário: 9h Local: Sala de Seminários - Bloco 952 - Campus do Pici**

**Resumo:**

Trajectory pattern mining allows characterizing movement behavior, which leverages new applications and services. Movement tracking becomes ubiquitous in many applications, which raises great interests in trajectory data analysis and mining. Most existing approaches allow characterizing the past movements of the objects but not current patterns, because they use only historical trajectory data. Recent approaches for online clustering of moving objects location are restricted to instantaneous positions. Subsequently, they fail to capture moving objects' behavior over time. By continuously tracking moving objects' sub-trajectories at each time window, rather than just the last position, it becomes possible to gain insight on the current behavior, and potentially detect mobility patterns in real time. In the first line of investigation we tackle the problem of discovering and maintaining the density based clusters in trajectory data streams in Euclidean Space, despite the fact that most moving objects change their position over time. We propose CUTiS, an incremental algorithm to solve this problem, while tracking the evolution of the clusters as well as the membership of the moving objects to the clusters. Our experiments were conducted on two real datasets and it shows the efficiency and the effectiveness of our method comparing to two competitors DBSCAN (ESTER et al., 1996) and TraClus (LEE; HAN; WHANG, 2007). As a second line of research we aim at improving the efficiency of CUTiS algorithm. In this way, we propose an indexing structure for sub-trajectory data based on a space-filling curve which has the property of mapping a multidimensional space to one-dimensional space such that, for two objects that are close in the original space, there is a high probability that they will be close in the mapped target space. We take advantage of this property to optimize range queries from a moving object sub-trajectory on the

incremental clustering algorithm. Our experiments were conducted on a real data set and it shows the efficiency and the effectiveness of our method comparing to our previous proposed CUTiS, DBSCAN and TraClus. As a third line we investigate the same problem of sub-trajectory clustering discovery and maintenance on Road Network since many moving objects move on the road network in real applications. We propose Net-CUTiS an incremental clustering algorithm for road network constraint movement. The efficiency and effectiveness of Net-CUTiS were compared using a real dataset with the approach of (KHARRAT et al., 2008) and DBSCAN (ESTER et al., 1996).

Banca:

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