Mining Group Patterns in Moving Objects

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Period: 29/06/2013 to 29/07/2013

Abstract. The tremendous advances of the positioning technologies, such as telemetry, GPS equipment and smart mobile phones, have enabled tracking of any type of moving objects. In these types of applications one can be interested in the discovery of groups of objects which move together or similarly. This kind of problems has been investigated with techniques for mining group patterns, such as such as flock, convoy, and swarm, which allow to represent common and similar trajectories but do not capture aspects on the dynamics and relatedness of the movements. Indeed, a group can turn out to be interesting not only when its members are spatially close and move similarly, but also when they are far apart and have different but interrelated movements. In this STSM we defined a computational solution to mine this kind of groups of moving objects. We first defined a geo-spatial feature vector to model original trajectories and capture dynamics and relatedness. Then, an ad-hoc algorithm to mine groups in the form of clusters was synthesized and implemented. It follows a clustering-inspired strategy but does not rely on a distance/dissimilarity notion. Finally, the method was applied to real-world trajectories.

Keywords: Group patterns, movements, dynamic, clustering,