A new approach for predicting the future position of a moving object: Hurricanes case study

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Abstract

Nowadays, huge amounts of tracking data related to moving objects are being generated and collected in suitable repositories thanks to GPS devices, RFID sensors, satellites and wireless communication technologies. Tracked moving objects could be pedestrians, cars, vessels, planes, animals, natural disasters. Those letters generate trajectory data that contain a great deal of knowledge. For this reason, these trajectory data sets need an urgent and an effective analysis process and constitute a rich source for inferring mobility patterns. Predicting the future position of a given moving object is one of the important tasks we can find in the knowledge discovery process. In fact, being able to predict a moving object's future position related to natural phenomena, would allow decision makers to take strategic decisions in order to help the humanity, and prevent or avoid the propagation of natural catastrophes. The aim of this paper is to propose a new approach to predict the future position of a moving object, especially a moving region based on mobility patterns. To achieve this aim, we experiment our approach on a real case study related to hurricanes as moving regions. The proposed approach is composed of three phases. The first phase allows generating object mobility patterns. In the second phase, spatio-temporal mobility rules are extracted from the generated patterns. In the third and last phase, hurricane future position prediction is accomplished by using the extracted rules.

Full Text

Due to technical limitations, full-text HTML conversion of this manuscript could not be completed. However, the manuscript can be downloaded and accessed as a PDF.

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