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Multi-Objective Decision Making Tools
through Citizens Engagement

PREDICTING OBJECT TRAJECTORIES FROM HIGH-SPEED STREAMING DATA

Huge amounts of loosely structured and high velocity data are now being generated by ubiquitous mobile sensing devices, aerial sensory systems, cameras and radiofrequency identification readers, which are generating key knowledge into social media behaviors, intelligent transport patterns, military operational environments and space monitoring, safety systems etc. Machine learning models and data mining techniques can be employed to produce actionable intelligence, based on predictive and prescriptive analytics. However, more data is not leading to better predictions as the accuracy of the implicated learning models hugely varies in accordance to the complexity of the given space and related data. Especially in the case of open-ended data streams of massive scale, their efficiency is put to the challenge. In this work, we employ a variety of machine learning methods and apply them to geospatial time-series surveillance data, in an attempt to determine their capacity to learn a vessels behavioral pattern. We evaluate their effectiveness against metrics of accuracy, time and resource usage. The main concept of this study is to determine the most appropriate machine-learning model capable of learning a vessels behavior and performing predictions into a future point in time. Our aim is to document the prediction accuracy of a set of traditional forecasting models and then compare this to the prediction accuracy of streaming algorithms.

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