Public Abstract
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Title:ANIMAL STAY REGION DETECTION AND BEHAVIOR ANALYSIS BASED ON GPS TRAJECTORIES

Nowadays, GPS technology is becoming an important tool in tracking and understanding wild animal behaviors. For example, Missouri Department of Conservation (MDC) has put GPS collars on more than 80 black bears and more than 150 deer and collected a large amount of GPS data. In this project, several semantic analysis methods have been implemented and applied to GPS data provided by MDC. After the raw data are cleaned using outlier detection methods, stay regions in each GPS trajectory are detected using the SeqScan algorithm. Based on the stay regions, various statistics of individual animals and among different groups of animals, such as male and female, are generated to provide insights of animal behaviors and help answer questions that biologists are interested in. Multidimensional scaling technique is used to analyze and visualize relationships between different animals in terms of the overlaps of their stay regions. A software pipeline has been implemented to apply the proposed methods and a website has been created to show the results on Google map, which give the biologists a convenient tool to perform some quick analysis of raw GPS trajectories.