1. Introduction

The increasing availability of high-resolution geospatial data sets with limited storage capacity such as LiDAR, satellite, and airborne Light Detection and Ranging (LiDAR) data, has opened new possibilities for monitoring phenology, land cover, and ecosystem services. This research explored the use of high-dimensional cluster analysis to detect measurable changes in the timing of events in remote sensing phenology data. Cluster analysis, in this research, was used to detect the temporal shifts in the occurrence of these events using high-dimensional acceleration techniques.

2. Accelerated k-means Clustering

We have performed optimization of accelerated k-means clustering, following the parallel processing model.

2.1 Parallel Performance

2.1.1 Accelerated k-means code

2.1.2 Improving computational intensity

2.1.3 Clustering time on Intel Xeon E7 v3 ("Haswell-EX"), 72 cores

2.2 Applications: Quantitative Evaluation and Change Detection

3. Principal Components Analysis

3.1 Parallel Components Analysis Tool

4. Detecting anomalies within a single year, single NEON domain

5. Notions and Disclaimers

Acknowledgments

References