Comparison of Missing Data Estimation Methods in Satellite Information for Scientific Exploration

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ABSTRACT:

The study on Missing Data Estimation Methods plays an important role in satellite information for scientific exploration. In order to study the pollution of the earth atmosphere, many pictures from different angels of atmosphere have been taken by science exploring satellite. However, many data sent from satellite are lost due to the effect of satellites' orbits difference, weather conditions and photography tools. Several general methods such as K-Nearest Neighbor(KNN), Average Value Method and Single Value Decomposition(SVD) are introduced and compared in this paper. KNN is characterized by predicting accurately missing data that are classified by a small set. Experimental results show that the average value method's effect is not evident; SVD also has some limitations and KNN can predict data loss rapidly and accurately. It also suggests satellite information is strongly interrelated with space and time.

Keywords: satellite information, data loss, K Nearest Neighbor (KNN), Singular Value Decomposition (SVD)