Analysis of Satellite Image Time Series Based on Information Bottleneck

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Abstract

Derived from Information theory, the Information Bottleneck principle[3] enables to quantify and qualify the information contained in a signal. This paper presents an algorithm based on the Information Bottleneck principle to analyze Satellite Image Time Series (SITS). The entropic method includes a parameters estimation and a model selection. This method has been applied to textural and radiometric parametric models[1, 2]. Thus, textural and radiometric information contained in SITS has been quantified. This paper presents a method to take into account the geometry information. Two approaches are presented. On one hand, each image of the SITS is segmented and the obtained regions are described by radiometric, textural and geometric models. Using the Information Bottleneck method on these models, this approach leads to a spatio-temporal characterization of the spatial regions of the SITS. On the other hand, the geometrical information is extracted first from a segmentation , then the radiometric and textural information is extracted through the Information Bottleneck method. This approach leads to a temporal characterization of the spatial regions of the SITS.

References

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