

Efficient Filtering of Graph Based Data Using Graph Partitioning

Authors : Nileshkumar Vaishnav, Aditya Tatu

Abstract : An algebraic framework for processing graph signals axiomatically designates the graph adjacency matrix as the shift operator. In this setup, we often encounter a problem wherein we know the filtered output and the filter coefficients, and need to find out the input graph signal. Solution to this problem using direct approach requires $O(N^3)$ operations, where N is the number of vertices in graph. In this paper, we adapt the spectral graph partitioning method for partitioning of graphs and use it to reduce the computational cost of the filtering problem. We use the example of denoising of the temperature data to illustrate the efficacy of the approach.

Keywords : graph signal processing, graph partitioning, inverse filtering on graphs, algebraic signal processing

Conference Title : ICICSP 2017 : International Conference on Information, Communications and Signal Processing

Conference Location : Singapore, Singapore

Conference Dates : March 29-30, 2017