TELKOM UNIVERSITY

Abstract

SCHOOL OF ELECTRICAL

The Graduate School

Master Engineering

Network traffic data consists of Traffic Matrices (TMs), which represents the volumes of traffic between Origin and Destination (OD) pairs in the network. It is a key input parameter of network engineering tasks. Even good traffic measurement systems can suffer from errors or missing data. To recover the missing entries in vectors of traffic data, a novel spatial vector completion method has been proposed. This approach not only takes advantage of vector decomposition and its lower-dimensional representation but also well takes into account traffic spatial properties. Compressive sensing is a generic methodology for dealing with missing values that leverage the presence of certain types of structure and redundancy in data from many real-world systems. Missing traffic data estimation can significantly skew throughput calculations, including generating values greater than 100%.

In previous research in the field of communications systems, the proposed interpolation techniques to accurately reconstruct missing values in TMs based on partial and indirect measurements. The results of analysis the Sparsity Regularized Matrix Factorization (SRMF) algorithms used, author are able to do reconstruction to 90% better than other methods commonly used in the interpolation process. But in this method has some drawbacks takes longer in the process of its computing as well as the process of determining the value of k is done in a random selection, where the value of k can minimize of performance classification.

In this research, despite much recent progress in the area of compressive sensing, with developing Sparsity Regularized SVD (SRSVD) using ℓ_2-optimization norm technique, which finds low-rank approximations of TMs that account for spatial properties of real TMs. Based that can be used to find solutions of SPL is consistent and best solutions to approach the SPL is inconsistent and SRSVD can be used to find the pseudo inverse and rank of a matrix. The results of analysis the algorithms used, author are able to do reconstruction to 98% with NMSE $3x10^{-3}$ better than other methods commonly used in the interpolation process. So every SPL and estimation of missing data can be searched using the SRSVD algorithm in a way that is easy, fast and small NMSE. Our results provide a promising new direction for estimating such matrices.