Abstract

Security of a network is important to all organizations, personal computer users, and the military. With the invention of the Internet, major concern is about the security and the history of security allows a better understanding of the emergence of security technology. One of the ways to secure businesses from the Internet is through firewalls and encryption mechanisms. A network can be designed as a sigraph $S$ where every sigraph will have its unique adjacency matrix associated with it. A signed graph (or sigraph in short) $S$ is a graph $G$ in which every edge $x$ carries a value $s(x) \in \{-1, +1\}$ called its sign denoted specially as $S = (G, s)$. Given a sigraph $S$, $H = L(S)$ called the line sigraph of $S$ is that sigraph in which edges of $S$ are represented as vertices, two of these vertices are adjacent whenever the corresponding edges in $S$ have a vertex in common and any such edge $ef$ is defined to be negative whenever both $e$ and $f$ are negative edges in $S$. Here $S$ is called root sigraph of $H$. In this paper first we give an algorithm to obtain a line sigraph [1] and line root sigraph from a given sigraph [1], if it exists. This algorithm is an extension of an algorithm given by Lehot [2] in the realm of sigraphs. In the end we will propose a technique that will use adjacency matrix of $S$ as a parameter to encrypt
and forward the data in the form of adjacency matrix of L(S) and will decrypt it by applying inverse matrix operations.

**References**


**Index Terms**

Computer Science  
Applied Mathematics

**Keywords**

Algorithm, sigraph, line sigraph, root sigraph, sign-compatible, network, network security, encryption, decryption.