Wirelength in Interconnection Networks and Chemical Graphs

Abstract

The sum of distances between all pairs of vertices in a graph is an important concept in mathematics, computer science, and cheminformatics, to mention just some central areas of interest. In computer science, the sum of distances is used as a fundamental parameter to measure the communication cost in networks. Wiener index (sum of distances between all pairs of vertices) is an important concept in cheminformatics as chemical graph theory views molecular structures of organic compounds as graphs, often referred to as molecular graphs wherein atoms are represented by vertices and covalent chemical bonds are represented by edges. Wiener index is used to find out the stability of the chemical components through chemical bonding. Graph embedding that maps a guest graph into a host graph is used to model many problems. Embedding concept in graphs has wide range of applications in communication network, cheminformatics and it has been known as a powerful technique to solve simulations in interconnection networks. There are few parameters to validate the quality of an embedding. One of these criteria is the wirelength. In this talk we shall discuss the wirelength problem for Interconnection Networks and deduce wiener index as a special case which is widely studied in cheminformatics.