

## Research Statements

My research interests are in the areas of routing, security, and QoS support in wireless and sensor networks, optical networks, mobile computing, and Bioinformatics.

### 1. **Wireless and Sensor Networks**

Wireless and sensor networks provide the capability to detect and track multiple, simultaneous events for management and security in commercial and military environments. Protection of wireless and sensor networks from attacks is very important and necessary. The research will focus on secure and scale routing protocols for large-scale sensor networks. This is the part of research in DARPA Nest Extreme Scaling Echelon project in the Department of Computer and Information Science at Ohio State University.

### 2. **Differentiated Service Support in Optical Networks**

Differentiated Service Support is very important in the future optical Internet. Burst scheduling schemes were proposed to support differentiated services in optical burst switching WDM networks. These schemes provide service differentiation in terms of burst loss probability without causing multimedia synchronization problem. One of the schemes, *enhanced differentiated scheduling*, enables each intermediate node to choose its own number of priority classes to support.

### 3. **Multimedia over Wireless Ad Hoc Networks**

Multimedia applications will be supported in future wireless and ad hoc networks. Mechanisms for the control and management of QoS in these networks are necessary. We have proposed a scheme and will continue to study medium access control and transmission of H.263 video over multi-code CDMA wireless ad hoc networks.

### 4. **Bioinformatics**

Biological pathways evolve along with time resulting into so-called scale-free networks. We will use graph theory (graph isomorphism, maximal clique, etc.) to compare the same biological pathways of evolutionarily distinct species. We use sequence alignments to establish evolutionary constraints on each pair of protein-protein interactions and thus the edges of the graph will be weighted. The goal is to show some portion of the network is conserved whereas others are not.