Abstract:

I will describe two branches of my work related to algorithms for distributed networks. The main focus will be devoted to Fault-Tolerant (FT) Network Structures. The undisturbed operation of structures and services is a crucial requirement in modern day communication networks. As the vertices and edges of the network may occasionally fail or malfunction, it is desirable to make those structures robust against failures. FT Network Structures are low cost highly resilient structures, constructed on top of a given network, that satisfy certain desirable performance requirements concerning, e.g., connectivity, distance or capacity. We will overview some results on fault tolerant graph structures with a special focus on FT Breadth-First-Search. The second part of the talk will discuss distributed models and algorithms for large-scale networks. Towards the end, we will see some connections between distributed computing and other areas such as EE and Biology.