Abstract

Network of workstations (NOW) have become important and cost-effective parallel platform for scientific computations and gained tremendous popularity and attention from the research community in recent years. Many systems provide this environment and programming model to achieve parallelism in NOW. However, still it is faced with many practical difficulties. One of the major problems is lack of high level programming model for the parallel programming in NOW. Many programming languages provide an efficient system, but employ a relatively low level programming model which is too complex to be used in network environment.

This dissertation deals and addresses the above said problem by amalgamating the object orientation paradigm and parallelism to provide an effective object oriented parallel programming model. The object orientation is a powerful paradigm in software engineering with wide acceptance. It provides support for the construction of modular and reusable program components and it is attractive for the design of large complex serial programs. Apart from the merit of the object oriented programming concepts, the approach of the object orientation is inherently parallel by means of modules. That is the steps of designing the modules in object orientation is befitted to the steps of decomposition of a problem in the parallel programming based on message passing technique. Based on this approach, a new object oriented parallel programming model called OP++ has been presented. In addition, a new parallel

algorithm has been developed for *Traveling salesman problem with different modes of transport* and its implementation in OP++ has been described. Moreover, the experimental results and its observation are presented.