PROGRAMMING MODELS FOR FACILITY DISPERSION:
THE p-DISPERSION AND MAXISUM DISPERSION PROBLEMS

MICHAEL J. KUBY
Department of Geography, Boston University, Boston, Mass., U.S.A.

Abstract—The p-dispersion problem is to locate p facilities on a network so that the minimum separation distance between any pair of open facilities is maximized. This problem is applicable to facilities that pose a threat to each other and to systems of retail or service franchises. In both of these applications, facilities should be as far away from the closest other facility as possible. A mixed-integer program is formulated that relies on reversing the value of the 0-1 location variables in the distance constraints so that only the distance between pairs of open facilities constrain the maximization. A related problem, the maximum dispersion problem, which aims to maximize the average separation distance between open facilities, is also formulated and solved. Computational results for both models for locating 5 and 10 facilities on a network of 25 nodes are presented, along with a multicriteria approach combining the dispersion and maximum problems. The p-dispersion problem has a weak duality relationship with the (p-1)-center problem in that one-half the maximin distance in the p-dispersion problem is a lower bound for the minimax distance in the center problem for (p-1) facilities. Since the p-center problem is often solved via a series of set-covering problems, the p-dispersion problem may prove useful for finding a starting distance for the series of covering problems.

THE STATISTICAL MODELING OF FLOW DATA WHEN
THE POISSON ASSUMPTION IS VIOLATED

RICHARD B. DAVIES
Centre for Applied Statistics, University of Lancaster, Lancaster, England

CLIFFORD M. GUY
Department of Town Planning, UWIST, Cardiff, Wales

Abstract—The Poisson model typically provides a poor fit to flow data but more complex models are difficult to operationalize, especially with production or attraction constraints. Quasi- and pseudo-likelihood approaches retain the attractive computational features of the Poisson model. A shopping model example suggests the latter approach to be preferable.

A COMPREHENSIVE MODEL FOR THE DESIGN OF
DISTRIBUTED COMPUTER SYSTEMS

HEMANT K. JAIN
School of Business Administration, University of Wisconsin—Milwaukee, Milwaukee, WI 53201, U.S.A.

Abstract—The availability of micro-, mini- and supercomputers has complicated the laws governing the economies of scale in computers. A recent study by Ein-Dor [7] concludes that it is most effective to accomplish any task on the least powerful type of computer capable of performing it. This change in cost/performance, and the promise of increased reliability, modularity, and better response time has resulted in an increased tendency to decentralize and distribute computing power. But some economic factors, such as the communication expenses incurred and increased storage with distributed systems are working against the tendency to decentralize. It is clear that in many instances the optimal solution will be an integration of computers of varying power.