

ABSTRACT

In this paper, I will present the research work of general network representation of systems in a computer system, and then solve some engineering problems using these network representations of the systems, to show the importance of network representation to the efficiency of a computer tool such as CAD or GIS. An example of research work in telecommunication network was chosen to show the application of computer representation of a graph in CAD system. The problem of searching and verification was addressed through this research work done in INESC Portugal.

Discussing the method of solving optimisation of network problems, an algorithm simulating the model of natural evolution named Evolutionary Programming (EP) is adopted helping to find out a set of solutions. In comparing to the other heuristic methods, EP directly works on real-valued object variables based on stochastic process – probabilistic distributed random change in solutions (mutation, which is the main operator of the process) and selection. Examples of Power Distribution Networks are chosen to observe the adaptability of the method to practical cases. The results of using EP showed an adequate performance of the algorithm, when the objective has been defined as finding network configurations that minimise power losses. This has been an innovative work that suggests new paths for research.