Conclusions

The accuracy achieved in the sofa program indicates the feasibility of a numerical approach to the two-dimensional sofa problem. The ideas in the program are readily extendable to three dimensions and a solution to the more general sofa problem in which it is required to determine whether or not a deformable three-dimensional object can be moved between two points inside a three-dimensional structure is being programmed.

Because of its evident formulation in terms of a network search, the sofa problem has led to the idea of programming schema in which different strategy routines can be applied to the same problem or, alternatively, the same strategy routine can be applied to different problems. Such a schema is being used to program the three-dimensional sofa problem and it is hoped that it will provide a technique for minimising storage requirements and computation time. The schema is a method of dividing the different parts of heuristic programs into: (i) overall or global strategies for dealing with problem networks as a whole, (ii) local strategies for dealing with particular nodes in problem networks, (iii) global data programs for providing overall information about a specific problem, and (iv) local data programs for providing particular points of information about a specific problem. Possible increases in computation time may result from the increased cost of communication between the different parts of a program that is split up in this manner. However, since most of the computation time is consumed within single blocks of program (e.g. the routine that checks to see if a given node is in N in the sofa program), the increase in computation time will be small relative to the advantages gained in providing for the variable use of different strategies. The efficiency of a heuristic program rests more in its ability to avoid processing non-relevant information contained in the problem network (i.e. in the efficiency of its strategy) than in the speed with which different parts of the program operate and communicate. The facility for testing and improving the strategy of the sofa program should be an important benefit of the programming schema. 'If you want to choose between selectivity and speed, choose selectivity because it will buy a great deal' (Selfridge, 1965).

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