

CONCLUSION

We have endeavoured to provide in this thesis an analogous translation of the notion of indifference graphs, containment graphs and overlap graphs to directed graphs. We have also introduced Robin digraphs where the vertices are associated with pairs of base intervals. In doing so, we have explored some lines of thought, wherein we have answered a number of questions completely and given partial answers to some others. Yet a good number of related open problems remain in each of the area discussed. Leaving aside many of such unsolved problems we explicitly state below only a few which arise immediately from our work and on which further research may be carried out in future.

1. In Chapter II, we have shown one example of interval digraph that is not an indifference digraph. Lin and West (preprint) have proved that a digraph is an indifference digraph if and only if its adjacency matrix^{is} free of a set of six forbidden submatrices. Afterwards the result has been considerably modified by Lin, Sen and West (preprint). In a recent paper Steiner (preprint) obtained a recognition algorithm for indifference digraphs in linear time. With this, the basic problem of this area is possibly solved and we now hope that this area, as in the case of indifference graph will find its application to other theories.

2. The problem of characterizing an interval digraph in terms of a complete list of forbidden submatrices of adjacency matrix still remains open. Also there is no efficient algorithm to test a digraph for an interval digraph.

3. Prisner [1989] obtained a characterization for interval catch digraphs in terms of diasteriodal triples. In Chapter III we have also obtained a result of reflexive interval digraph in terms of specially defined diasteroidal triple. But this is only a necessary condition. Whether this condition is sufficient also is an open problem. Again the problem "to find out a characterization of an interval digraph (not necessarily reflexive) in terms of some well defined diasteroidal triple in the line of the work by Lekkerkerker and Boland [1962]" remains open.

4. One may try to define boxicity, cubicity and other higher dimensional analogues for directed graphs. This inter^{-r}related area is still to be explored and interesting results may be obtained.

5. In Chapter III, we have proved that interval digraph can be viewed as a generalization of interval graph. But whether there is any such relationship between circular arc graph and circular arc digraph is yet to be investigated.

6. One can define proper circular arc digraphs and unit circular arc digraphs in the fashion of corresponding circular arc graphs and investigate the inter-relations between them.

7. In Chapter IV we have characterized exclusively right overlap interval digraphs. Now replacing intervals by circular arcs and characterizing the corresponding digraphs remains to be explored.

8. In Chapter V again replacing the notion of base interval by the pair of circular arc and base point, which we may call 'base circular arc', we can proceed along and study nature of the corresponding digraphs.