

A B S T R A C T

In this thesis we consider the automated drawing of certain classes of graphs using a digital incremental plotter. We present algorithms to transform a graph from algebraic form into a visual representation in the plane displaying specified properties. We consider the design, the calculation and the automatic layout and plotting for drawings of these graphs.

Chapter one gives a general introduction to the problem; it introduces the concepts and terms used throughout the thesis.

Chapter two considers the automated drawing of a tree. The algorithm produces two drawings of the tree; the first associated with a central vertex and the second with a centroidal vertex.

Chapter three presents an algorithm for the automated plane drawing of a planar graph. It incorporates the planarity testing algorithm by Hopcroft and Tarjan.

Chapter four considers the symmetry operation of reflection and defines a symmetrical graph. The

algorithm gives a drawing for a symmetrical graph displaying the symmetry. In this chapter the drawing algorithm is applied to the displaying of catalogues of self-complementary graphs.

Chapter five gives the scope for further research in the area of the automated drawing of graphs.

Computer listings (in FORTRAN & ALGOL) for all the algorithms are included as an Appendix.