

INTERACTIVE COMPUTER GRAPHICS AND THE DESIGN OF WOVEN TEXTILES

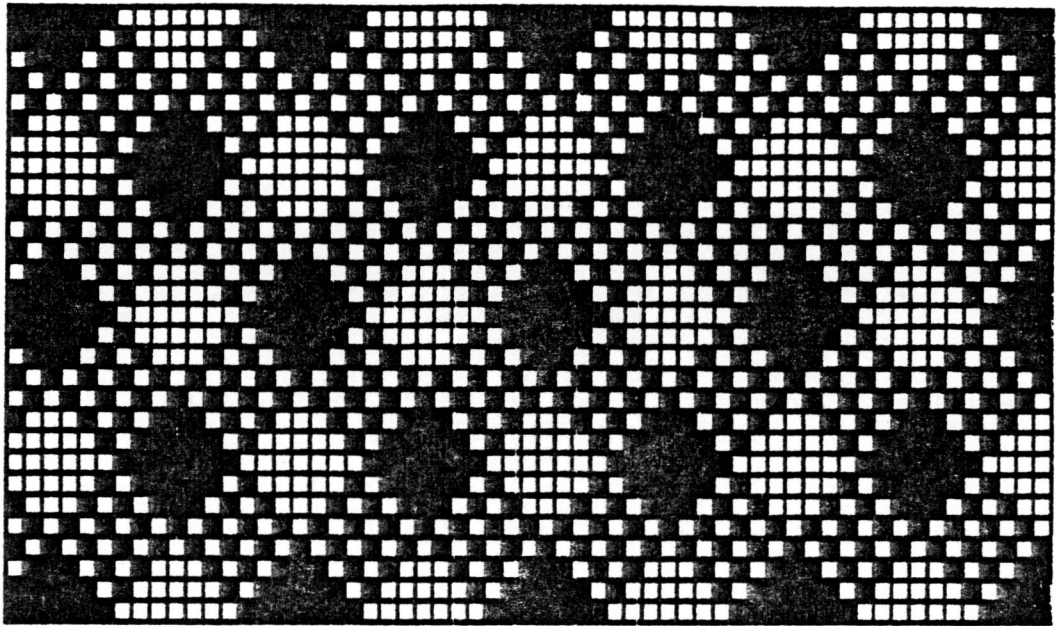
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ABSTRACT

The use of interactive computer graphical techniques in establishing a good environment for the design and analysis of woven textile structures is examined. A novel microcomputer implementation of these techniques is discussed in terms of the manipulation of the initial design data to enhance the aesthetic and structural properties of the fabric design. This implementation is also discussed with reference to the formulation of appropriate state transition diagrams to describe the required processing. The need for archives of classic structural designs is included and illustrated with the planar isonmenal forms. Additional illustrative examples of textile structures are included which exhibit patterning at both the macro (or block) level, as well as the micro (or individual intersection) level.

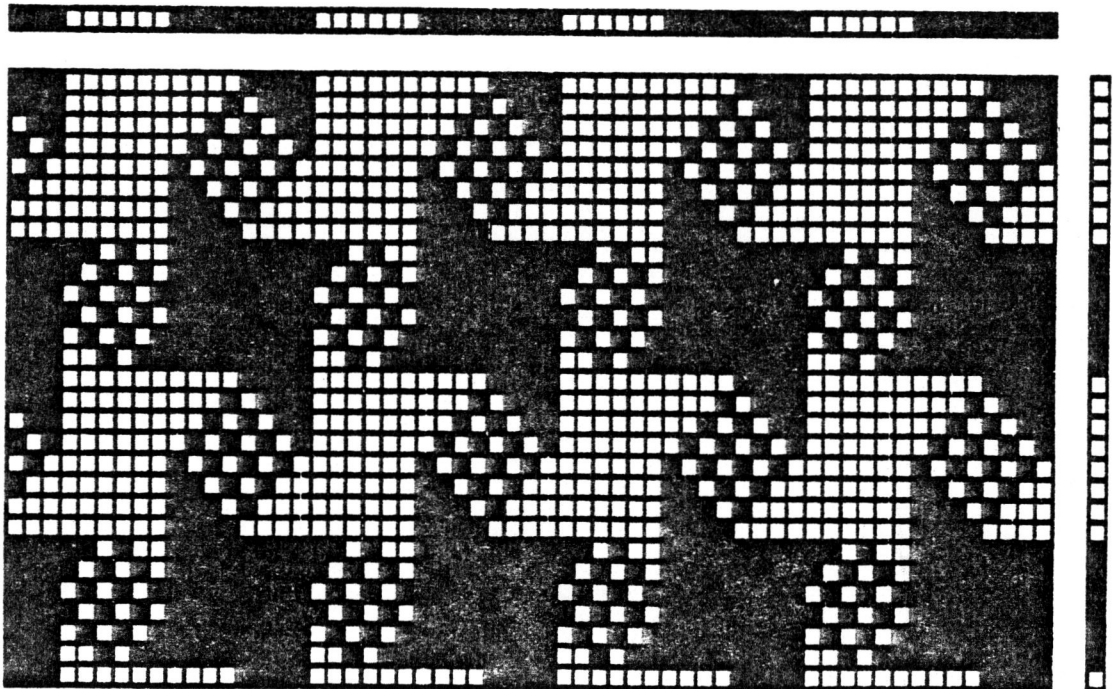
REFERENCES

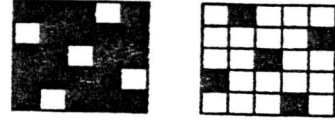
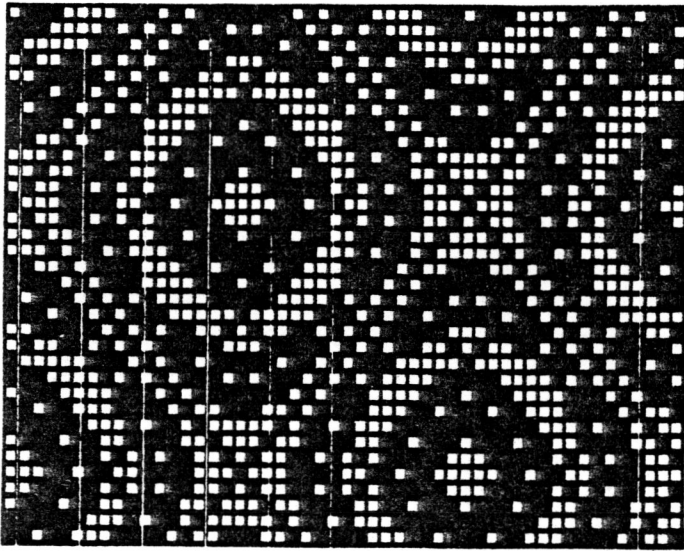
- (1) C. L. J. Clapham; "When a Fabric Hangs Together"; Bull. London Math. Soc. 12 (1980); 161-164.
- (2) J. D. Foley and A. Van Dam; "Fundamentals of Interactive Computer Graphics"; Addison-Wesley Publishing Company; Philippines; 1982.
- (3) Z. J. Grosicki; "Watson's Advanced Textile Design: Compound Woven Structures"; (4th ed.); Newnes-Butterworths; London; 1977.
- (4) Z. Grosicki; "Watson's Textile Design and Colour: Elementary Weaves and Figured Fabrics"; (7th ed.) Newnes-Butterworths; London; 1975.
- (5) Janet A. Hoskins; "Computerized Analysis of the Drawdown"; Shuttle, Spindle and Dyepot; Vol. XIII, No. 1; 66-67.
- (6) Janet A. Hoskins; "Computerized Fabric Analysis"; Shuttle, Spindle and Dyepot; Vol. XIV; No. 1; 26-27.
- (7) Janet A. Hoskins and W. D. Hoskins; "The Solution to Certain Matrix Equations Arising from the Structural Analysis of Woven Fabrics"; Ars Combinatoria; Vol. 11 (1981); 51-59.
- (8) W. D. Hoskins and Anne Penfold Street; "Twills on a Given Number of Harnesses"; J. Aust. Math. Soc. (A) 32 (1982).
- (9) Janice R. Lourie; "The Textile Designer of the Future"; Handweaver and Craftsman; Winter 1966; 8.
- (10) Janice R. Lourie; "Textile Graphics/Computer-Aided"; Fairchild Publications, Inc.; New York; 1973.
- (11) Janice R. Lourie and Alice M. Bonin; "Computer-Controlled Textile Designing and Weaving"; Proceedings - IFIPS; 1968; 884.
- (12) Janice R. Lourie, John J. Lorenzo and Abel Bomberault; "On-Line Textile Designing"; Proceedings - A.C.M. National Meeting; 1966; 537.
- (13) Shigeru Nishikawa; "Automatic Patterning Technique on Jacquard Weaving Process"; Bulletin of Research Institute for Polymers and Textiles; No. 105; 5.



8 SHAFT DESIGN

SAME 8 SHAFT DESIGN USING "COLOR AND WEAVE EFFECTS"

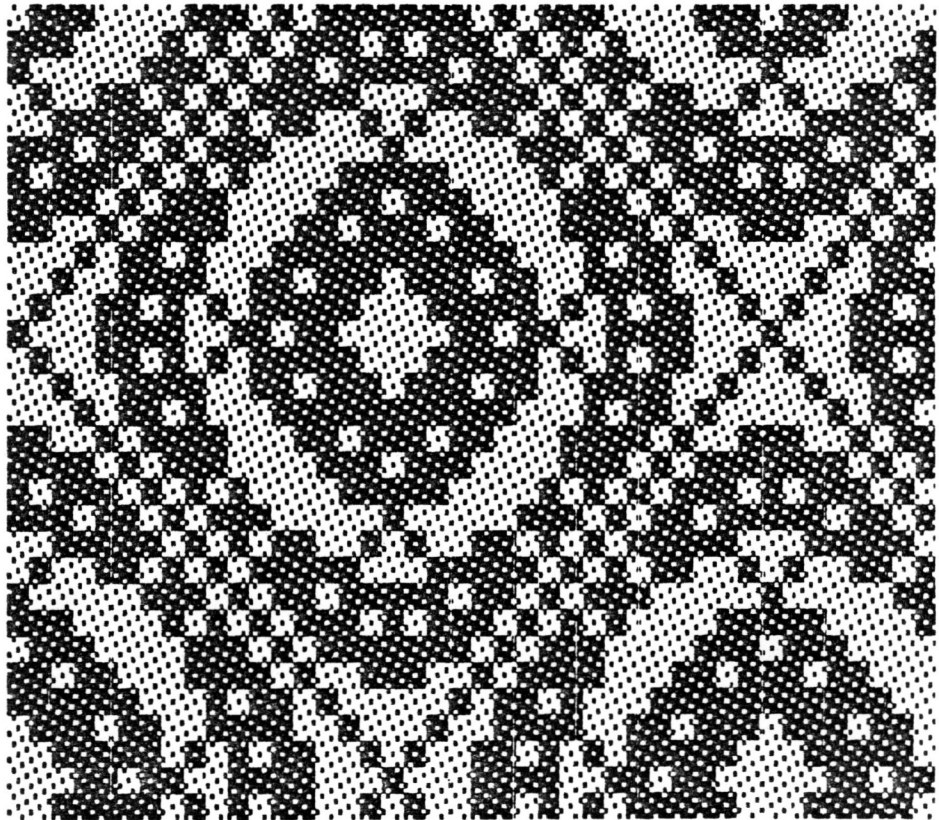


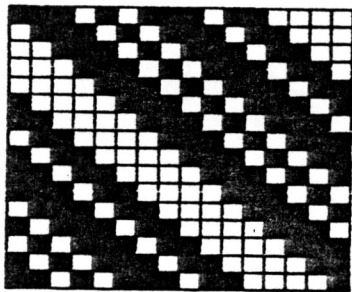


5 SHAFT SATIN AND  
SATEEN BLOCKS

DESIGN AS A BLOCK DRAFT

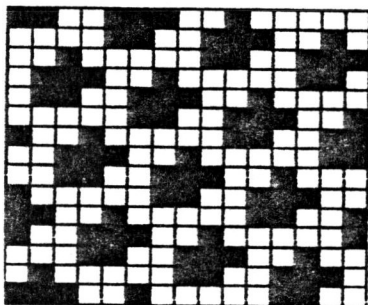
DESIGN WITH 5 SHAFT  
SATIN AND SATEEN  
BLOCK SUBSTITUTION



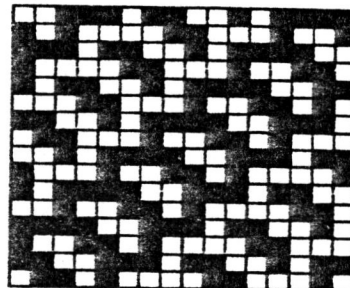


16 SHAFT TWILL

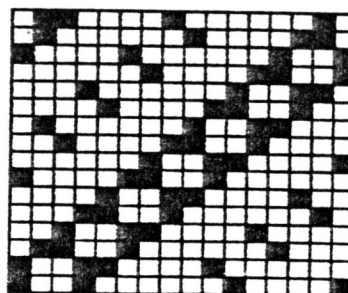
PLANAR ISONEMAL ARRAYS



15 SHAFT TWILLIN



16 SHAFT COLOR  
ALTERNATE TWILLIN



16 SHAFT COMPOUND  
TWILLIN