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SHAPE ANALYSIS AND CLASSIFICATION

Theory and Practice

Luciano da Fontoura Costa and Roberto Marcondes Cesar, Jr., University of Sao Paulo, Brazil

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A practical, integrated, conceptual treatment

Advances in shape analysis impact a wide range of disciplines, from mathematics and engineering to medicine, archeology, and art. Anyone just entering the field, however, may find the few existing books on shape analysis too specific or advanced, and for researchers interested in the specific problem of shape recognition and characterization, traditional books on computer vision are too general.

Shape Analysis and Classification: Theory and Practice offers an integrated and conceptual introduction to this dynamic field and its myriad applications. Beginning with the basic mathematical concepts, it deals with shape analysis from image capture to pattern classification and presents many of the most advanced and powerful techniques used in practice. The authors explore the relevant aspects of both shape characterization and recognition, and give special attention to practical issues, such as guidelines for implementation, validation, and assessment.

Shape Analysis and Classification provides a rich resource for the computational characterization and classification of general shapes, from characters to biological entities. Both beginning and advanced researchers can directly use its state-of-the-art concepts and techniques to solve their own problems involving the characterization and classification of visual shapes.

FEATURES

- Serves as both an introduction to and a reference for computer-based analysis and recognition of shapes
- Includes comprehensive review of the basic mathematical concepts involved
- Examines various techniques for shape characterization and analysis, including shape contour analysis and extraction of different shape measures for statistical classification
- Explains several multiscale techniques, such as wavelets and multiscale skeletonization
- Focuses on two-dimensional shapes but includes concepts and techniques that can be generalized for 3-D shapes
- Identifies future trends and developments
- Includes numerous illustrations and real-world examples

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