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Application of Chaos and Fractals to Computer Vision

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About the eBook

This book provides a thorough investigation of the application of chaos theory and fractal analysis to computer vision. The field of chaos theory has been studied in dynamical physical systems, and has been very successful in providing computational models for very complex problems ranging from weather systems to neural pathway signal propagation. Computer vision researchers have derived motivation for their algorithms from biology and physics for many years as witnessed by the optical flow algorithm, the oscillator model underlying graphical cuts and of course neural networks. These algorithms are very helpful for a broad range of computer vision problems like motion segmentation, texture analysis and change detection.

Contents

- ▶ Biological Vision Systems - Architecture and Signal Characteristics
- ▶ Foundations of Chaos and Fractals
- ▶ Behavior of Images and Image Sequences in Phase Space
- ▶ Mathematical Measures for Analyzing Phase Space
- ▶ Applications to Pre-attentive Vision - Using the Presence of Chaos for Attention Direction
- ▶ Applications to Attentive Vision - Chaotic Basins of Attraction for Motion and Contextual Change Segmentation
- ▶ Applications to Attentive Vision - Chaotic Analysis of Texture for Segmentation and Classification

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