Image Processing and Pattern Recognition: Fundamentals and Techniques

By Frank Y. Shih

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A comprehensive guide to the essential principles of image processing and pattern recognition

Techniques and applications in the areas of image processing and pattern recognition are growing at an unprecedented rate. Containing the latest state-of-the-art developments in the field, *Image Processing and Pattern Recognition* presents clear explanations of the fundamentals as well as the most recent applications. It explains the essential principles so readers will not only be able to easily implement the algorithms and techniques, but also lead themselves to discover new problems and applications.

Unlike other books on the subject, this volume presents numerous fundamental and advanced image processing algorithms and pattern recognition techniques to illustrate the framework. Scores of graphs and examples, technical assistance, and practical tools illustrate the basic principles and help simplify the problems, allowing students as well as professionals to easily grasp even complicated theories. It also features unique coverage of the most interesting developments and updated techniques, such as image watermarking, digital steganography, document processing and classification, solar image processing and event classification, 3-D Euclidean distance transformation, shortest path planning, soft morphology, recursive morphology, regulated morphology, and sweep morphology. Additional topics include enhancement and segmentation techniques, active learning, feature extraction, neural networks, and fuzzy logic.

Featuring supplemental materials for instructors and students, *Image Processing and Pattern Recognition* is designed for undergraduate seniors and graduate students, engineering and scientific researchers, and professionals who work in signal processing, image processing, pattern recognition, information security, document processing, multimedia systems, and solar physics.

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Editorial Review

About the Author
Frank Y. Shih is a professor jointly appointed in the Department of Computer Science, the Department of Electrical and Computer Engineering, and the Department of Biomedical Engineering at New Jersey Institute of Technology, Newark, New Jersey. He is also Director of Computer Vision Laboratory. He is an internationally renowned scholar and serves as the Editor-in-Chief for the *International Journal of Multimedia Intelligence and Security (IJMIS)*. Dr. Shih is currently on the editorial boards of *Pattern Recognition, Pattern Recognition Letters*, the *International Journal of Pattern Recognition and Artificial Intelligence*, *Journal of Information Hiding and Multimedia Signal Processing*, *Recent Patents on Engineering, Recent Patents on Computer Science*, *The Open Nanoscience Journal*, the *International Journal of Internet Protocol Technology*, and the *Journal of Internet Technology*. The recipient of several awards for distinguished research, Dr. Shih has also made significant contributions to information hiding, focusing on the security and robustness of digital steganography and watermarking.

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