

An Introduction to Object Recognition: Selected Algorithms for a Wide Variety of Applications (Advances in Computer Vision and Pattern Recognition)

Marco Alexander Treiber



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An Introduction to Object Recognition: Selected Algorithms for a Wide Variety of Applications (Advances in Computer Vision and Pattern Recognition) Marco Alexander Treiber Rapid development of computer hardware has enabled usage of automatic object recognition in an increasing number of applications, ranging from industrial image processing to medical applications, as well as tasks triggered by the widespread use of the internet. Each area of application has its specific requirements, and consequently these cannot all be tackled appropriately by a single, general-purpose algorithm.

This easy-to-read text/reference provides a comprehensive introduction to the field of object recognition (OR). The book presents an overview of the diverse applications for OR and highlights important algorithm classes, presenting representative example algorithms for each class. The presentation of each algorithm describes the basic algorithm flow in detail, complete with graphical illustrations. Pseudocode implementations are also included for many of the methods, and definitions are supplied for terms which may be unfamiliar to the novice reader. Supporting a clear and intuitive tutorial style, the usage of mathematics is kept to a minimum.

Topics and features: presents example algorithms covering global approaches, transformation-search-based methods, geometrical model driven methods, 3D object recognition schemes, flexible contour fitting algorithms, and descriptor-based methods; explores each method in its entirety, rather than focusing on individual steps in isolation, with a detailed description of the flow of each algorithm, including graphical illustrations; explains the important concepts at length in a simple-to-understand style, with a minimum usage of mathematics; discusses a broad spectrum of applications, including some examples from commercial products; contains appendices discussing topics related to OR and widely used in the algorithms, (but not at the core of the methods described in the chapters).

Practitioners of industrial image processing will find this simple introduction and overview to OR a valuable reference, as will graduate students in computer vision courses.

Marco Treiber is a software developer at Siemens Electronics Assembly Systems, Munich, Germany, where he is Technical Lead in Image Processing for the Vision System of SiPlace placement machines, used in SMT assembly.

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