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Three-dimensional Machine Vision

By Takeo Kanade

Springer-Verlag New York Inc., United States, 2011. Paperback. Book Condition: New. 240 x 160 mm. Language: English . Brand New Book ***** Print on Demand *****.A robot must perceive the three-dimensional world if it is to be effective there. Yet recovering 3-D information from projected images is difficult, and still remains the subject of basic research. Alternatively, one can use sensors that can provide three-dimensional range information directly. The technique of projecting light-stripes started to be used in industrial object recognition systems as early as the 1970s, and time-of-flight laser-scanning range finders became available for outdoor mobile robot navigation in the mid-eighties. Once range data are obtained, a vision system must still describe the scene in terms of 3-D primitives such as edges, surfaces, and volumes, and recognize objects of interest. Today, the art of sensing, extracting features, and recognizing objects by means of three-dimensional range data is one of the most exciting research areas in computer vision. Three-Dimensional Machine Vision is a collection of papers dealing with three-dimensional range data.

The authors are pioneering researchers: some are founders and others are bringing new excitement in the field. I have tried to select milestone papers, and my goal has been to make this book a reference work for researchers in three-dimensional vision. The book is organized into four parts: 3-D Sensors, 3-D Feature Extractions, Object Recognition Algorithms, and Systems and Applications. Part I includes four papers which describe the development of unique, capable 3-D range sensors, as well as discussions of optical, geometrical, electronic, and computational issues. Mundy and Porter describe a sensor system based on structured illumination for inspecting metallic castings. In order to achieve high-speed data acquisition, it uses multiple...



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