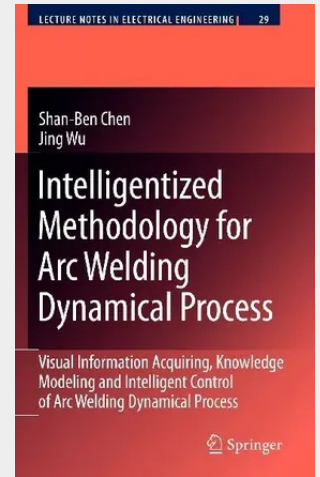


Intelligentized Methodology for Arc Welding Dynamical Processes

Visual Information Acquiring, Knowledge Modeling and Intelligent Control

Welding handicraft is one of the most primordial and traditional technics, mainly by manpower and human experiences. Weld quality and efficiency are, therefore, straitly limited by the welder's skill. In the modern manufacturing, automatic and robotic welding is becoming an inevitable trend. However, it is difficult for automatic and robotic welding to reach high quality due to the complexity, uncertainty and disturbance during welding process, especially for arc welding dynamics. The information acquirement and real-time control of arc weld pool dynamical process during automatic or robotic welding always are perplexing problems to both technologist in weld field and scientists in automation. This book presents some application researches on intelligentized methodology in arc welding process, such as machine vision, image processing, fuzzy logical, neural networks, rough set, intelligent control and other artificial intelligence methods for sensing, modeling and intelligent control of arc welding dynamical process. The studies in the book indicate that the designed vision sensing and control systems are able to partially emulate a skilled welder's intelligent behaviors: observing, estimating, decision-making and operating, and show a great potential and promising prospect of artificial intelligent technologies in the welding manufacturing.

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