



## Robotic Welding, Intelligence and Automation (Lecture Notes in Control and Information Sciences)

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Robotic welding systems have been used in different types of manufacturing. They can provide several benefits in welding applications. The most prominent advantages of robotic welding are precision and productivity. Another benefit is that labor costs can be reduced. Robotic welding also reduces risk by moving the human welder/operator away from hazardous fumes and molten metal close to the welding arc. The robotic welding system usually involves measuring and identifying the component to be welded, welding it in position, controlling the welding parameters and documenting the produced welds. However, traditional robotic welding systems rely heavily upon human intervention. It does not seem that the traditional robotic welding techniques by themselves can cope well with uncertainties in the welding surroundings and conditions, e. g. variation of weld pool dynamics, fluxion, solid, weld torch, and etc. On the other hand, the advent of intelligent techniques provides us with a powerful tool for solving demanding real-world problems with uncertain and unpredictable environments. Therefore, it is interesting to gather current trends and to provide a high quality forum for engineers and researchers working in the field of intelligent techniques for robotic welding systems. This volume brings together a broad range of invited and contributed papers that describe recent progress in this field.

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### **Editorial Review**

From the Back Cover

This book shows some contributions presented in the 2010 International Conference on Robotic Welding, Intelligence and Automation (RWIA'2010), Oct. 14-16, 2010, Shanghai, China.

Welding handicraft is one of the most primordial and traditional techniques, mainly by manpower and human experiences. Weld quality and efficiency are, therefore, straightly limited by the welder's skill. In the modern manufacturing, automatic and robotic welding is becoming an inevitable trend. In recent years, the intelligentized techniques for robotic welding have a great development. The current teaching play-back welding robot is not with real-time functions for sensing and adaptive control of weld process. Generally, the key technologies on Intelligentized welding robot and robotic welding process include computer visual and other information sensing, monitoring and real-time feedback control of weld penetration and pool shape and welding quality. Seam tracking is another key technology for welding robot system. Some applications on intelligentized robotic welding technology is also described in this book, it shows a great potential and promising prospect of artificial intelligent technologies in the welding manufacturing.

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**Laura Crabtree:**

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