
Preface

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To remain competitive in today's global market, manufacturers require systems that are capable of quickly responding to change while maintaining stable and efficient operation. The main barriers to achieving this goal result from the combination of increasingly stringent customer requirements (e.g. requirements for high-quality, customisable, low-cost products that can be delivered quickly) and inherent manufacturing system complexity (i.e. these systems are, by nature, distributed, concurrent and stochastic). Although manufacturing technology has become increasingly sophisticated to deal with these issues (e.g. through advanced robotics and computer numerical control), the resulting systems are often collections of 'islands of automation' that lack the necessary integration for truly responsive behaviour. As a result, intelligent industrial automation has become central to the development of adaptive manufacturing systems.

The objective of this special issue is to provide a forum for new results and directions in industrial automation and control. The two main themes of this special issue are:

- theoretical and implementation methodologies, tools and techniques for the development of intelligent industrial automation systems
- industrial applications of intelligent industrial automation systems.

The papers contained in this special issue span a wide range of intelligent industrial automation research covering the areas of intelligent industrial automation system architectures, simulation and benchmarks for industrial automation systems, holonic and multiagent systems, standards and interoperability, reconfiguration tasks, and industrial applications and case studies. As well, the papers are representative of the current work being carried out in these areas in North America, Europe and Asia.