THEME FEATURES

6  Guest Editor's Introduction: Software for Industrial Process Control
   Rudolph J. Lauber

11  Distributed Computer Systems for Industrial Process Control
    James D. Schoeffler
    Process control systems based on communication rings, broadcast systems, and clusters use data-highway communication networks to sustain communication even under heavy loads.

20  Control Software Specification and Design: An Overview
    Claudio Walter
    Bridging the gap between control theory and its application to complex industrial processes requires translating process requirements into economical, reliable software—a task control engineers can now undertake.

27  Process Control: Integration and Design Methodology Support
    Bruce W. Welde, Mark E. Brown, Jayashree Ramanathan, and Karsten Schwan
    Integration of computer-aided engineering systems is a major industrial challenge that cannot be met without computer science to identify design and control approaches.

37  Advanced Real-Time Languages for Distributed Industrial Process Control
    Hartwig U. Steusloff
    Genuine language elements for concurrency, extensive I/O, and fault tolerance are typical of programming languages for distributed process control. In one system, 28 furnaces are monitored using such a language.

48  Software Safety in Computer-Controlled Systems
    Nancy G. Leveson
    Hidden errors in process control software may result in major damage or loss of life. Fault-tolerant or error-free software is needed to circumvent this disaster.

59  Management of Industrial Software Production
    Yoshihiro Matsumoto
    Effective management of large-scale software production requires prototyping, reusing, and program generating in an environment with all levels of programming abstraction.

SPECIAL FEATURES

75  A Case Study in Applied Algorithm Design
    Jon Louis Bentley
    Practice and theory are intertwined in this solution to the traveling salesman problem—one that doubled the speed of a plotter in a geopolitical database system.

DEPARTMENTS

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