Theme Features

6 Multiparadigm Languages and Environments
   Guest Editor's Introduction  Brent Hailpern

10 Integrating Access-Oriented Programming into a Multiparadigm Environment
   Mark J. Stefik, Daniel G. Bobrow, and Kenneth M. Kahn
   The Loops knowledge programming system integrates function-oriented, object-oriented, rule-oriented, and—something not found in most other systems—access-oriented programming.

19 Extending the Scope of Relational Languages
   Henry F. Korth
   The relational model can serve as the foundation for an extended language with features of several languages, including functional and object-oriented languages, and allows alternative forms of expression.

29 Toward a Real-Time Dataflow Language
   Antony A. Faustini and Edgar B. Lewis
   This extension of the Lucid language seeks a high-level, real-time software-oriented tool with a formal mathematical semantics in which real time is part of correctness.

36 FAC: A Functional APL Language
   Hai-Chen Tu and Alan J. Perlis
   FAC, a functional array calculator language, features APL syntax and array operations but allows partitions, operators, and infinite arrays—extensions that are semantically plausible in APL.

46 Programming Styles in Nial
   Michael A. Jenkins, Janice L. Glasgow, and Carl D. McCrosky
   The programming language Nial supports several styles of programming. Its tools can be built to illustrate relational and object-oriented styles of programming.

56 Programming with Invariants
   Robert Paige
   The use of a restricted class of invariants as part of a language supports both the accurate synthesis of high-level programs and their translation into efficient implementations.

70 Multiparadigm Research: A Survey of Nine Projects
   Each project's research is concerned with providing the “right” set of constructs for the programmer, allowing him to use more than one mode of thinking for complex problems.