SPECIAL ISSUE (p. 9) “The articles in this special issue are intended to give insight into the characteristics of existing [software] development environments and to point the way toward some desirable characteristics of future ADSSs [automated development support systems]. Each of the articles takes a quite different perspective of the role of software tools and the way in which the tools fit together in support of the software development process.”

UNIX (p. 12) “In this article we describe what appears to be a new way of computing. We emphasize those things that are unique, particularly well done, or especially good for productivity. We also discuss aspects of the system that have changed our view of the programming process itself and draw some lessons that may be valuable to future implementors of operating systems.”

INTERLISP (p. 25) “Interlisp has been used to develop and implement a wide variety of large application systems. Examples include the Mycin system for infectious disease diagnosis, the Boyer-Moore theorem prover, and the BBN speech understanding system.

“The article describes the Interlisp environment, the facilities available in it, and some of the reasons why Interlisp developed as it has.”

THE NEXT FIVE YEARS (p. 35) “To encourage the growth of research and development activities in the area of software environments, the National Bureau of Standards Institute for Computer Science and Technology held a workshop on the subject late last spring. … What follows is a personal summary of the conclusions and recommendations of the group, written to acquaint wider audiences with an area of great and growing significance for the software community.”

PERSONAL PROGRAMMING (p. 45) “… we envision the integration of personal computers with sizable processing and storage capacity into video terminals. These computers will be capable of communicating with each other in a local or geographically distributed network and will be supported by significant new software to create a working environment tailor able to the individual needs of programmers.”

TUTORIAL (p. 54) “Because humans lack the ability to perform and communicate with perfection, software development is accompanied by a verification and validation activity. The importance of this activity to the software project continues to grow as data processing enters more areas, such as health and transportation, where software failures could have catastrophic results.”

AN OVERVIEW (p. 71) “Data compression can be made transparent to the user and can be implemented in either hardware, firmware, or software. While the overhead involved in compression—followed by expansion to recover the original data—is most severe in nonarchival situations, data compression is not without disadvantages. If, as is often the case, compression/expansion is done in software, it increases the software complexity of the system and directly increases the processing load of the system,...”

WORKSHOP REPORT (p. 80) “New technology is not without its failures, categorized as [complete, relative, environmental]. The 1970’s provided many examples of these types of failures, and the 1980’s can be expected to do the same. Will gallium arsenide ICs, Josephson junctions, and SOS be among them?”

POINT OF SALE (p. 85) “A retail point-of-sale terminal allowing retailers to tailor terminal operation to specific transaction needs, the TFC 7880 is the first product offered by the TRW-Fujitsu Company as a joint venture.”

“The terminal also offers as an option a magnetic-stripe credit card reader directly integrated into the terminal just above the keyboard.”

INTEGRATED CIRCUITS (p. 92) “The Konian-Walsh circuit makes possible the use of VLSI circuitry in high-performance computer systems, but it has applications in small, low-end computer systems, as well. For example, in small systems, fewer than 3,000 Konian-Walsh devices might be configured on a chip with circuit power in the 2.5 milliwatt range. In larger systems, the circuits might be packed at much higher densities, using .5 to .7 milliwatts.”

HISTORY (p. 95) “Ancient by the standards of the current computer age and a unique historical landmark, Eniac is now officially 35 years old. Built at the Moore School of the University of Pennsylvania School of Engineering and Applied Science, the massive Eniac, with eight-foot high sections containing thousands of vacuum tubes, was the first all-electronic, general-purpose, large-scale digital computer.”
TEACHING PROGRAMMING (p. 7) "I wish I had received Ted Lewis’ [March] column before I attended the SIGCSE conference on computer science education. I came away depressed because it appeared that Java is going to be a dominant language in beginning CS courses. Most of the folks I talked to who are switching to Java for CS1 hadn’t done more than a few hours work in it. Their usual comment was ‘it’s better than C++.' What a way to pick a language for teaching beginners the principles of our discipline.”

SOFTWARE DEVELOPMENT (p. 10) “Software development can be interpreted as the application of architectural styles to software systems. However, software development can also be understood as the application of humans to software development. Putting humans first, then, it is best to apply the right developers in order to build adequate software systems. This [pseudo]paper discusses the relationship between software developers and architectural styles and shows that these styles should adapt to human abilities, failings, and needs. Project success critically depends on achieving this goal.”

INTEL STRATEGY (p. 14) “For Intel … the Internet means millions of new customers, and Intel’s communications and Internet-related R&D is aimed at facilitating applications development and helping grow the market for Intel microprocessors. For instance, the company recently heralded the availability of several IAL-developed [Intel Architecture Labs] applications, inviting advanced computer users to ‘participate in how the Web may be shaped.’”

HACKING (p. 18) “Three undergraduate students uncovered a major flaw in Microsoft’s Internet Explorer browser. Microsoft had to scramble to fix the flaw, which could have given a hacker access to and control over an Internet Explorer user’s computer.”

TOMORROW’S INTERNET (p. 22) “The North Carolina Giganet is already operating with Internet 2 architecture. The ultrafast network—which serves Duke University, North Carolina State University, and the University of North Carolina, Chapel Hill—came online February 27 and has been functioning well.”

INTERNET TELEPHONY (p. 26) “The Voice on the Net Coalition (VON) plans to file a petition in the near future asking the FCC to deny a request by telephone companies to ban Internet telephony. VON says its plans to develop Internet telephony have been hindered by the FCC’s failure to rule on the request. The FCC says it plans to issue a ruling this year.”

TEXT ENCODING (p. 37) “Unicode was designed to extend ASCII for encoding text in different languages, but it still has several important drawbacks. Multicode overcomes those drawbacks.”

TOP-LEVEL DOMAIN NAMES (p. 106) “The issues swirling around IAHC’s proposal—trademark law, international law, monopoly, and efficient administration of a critical global database—are far-reaching. … It’s entirely possible that technical and administrative decisions vital to the future of the global Internet will be made by judges and legislatures. The days of simple Internet standards and procedures devised in a spirit of cooperation by leading technical minds may be over.”

MODEL-INTEGRATED COMPUTING (p. 110) “Computers now control many critical systems in our lives, from the brakes on our cars to the avionics control systems on planes. Such computers wed physical systems to software, tightly integrating the two and generating complex component interactions unknown in earlier systems.”

AUTOMATED TESTING (p. 114) “According to popular mythology, people with little programming experience can use GUI-level regression test tools to quickly and competently create extensive black box test suites that are easy to maintain. … These myths are spread by tool vendors, by executives who don’t understand testing, and even by testers and test managers who should (and sometimes do) know better.”

SEARCH ENGINES (p. 118) “It isn’t easy for search engines to keep up with the growth of both Internet content and users, but many corporations are meeting the challenge by cooperating with potential rivals to improve their service. … The only bad news is that it takes some effort to keep abreast of the latest and greatest in search engines. But as any serious researcher will tell you, it’s worth it.”

SOFTWARE REUSE (p. 120) “Founded by fur trappers in 1670 as a trading post, Hudson’s Bay [Company] has not only survived but thrived: It is Canada’s largest department store chain. Over the past 300 years, it has surmounted a lot of SIPS [strategic inflection points]—one may be software reuse. The company’s latest achievement is 85 to 90 percent reuse on six applications ranging in size from 100,000 to 4 million lines of code. Hudson’s Bay used Paul Bassett’s frame technology.”

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