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Expanding AI (p. 5) “In this article, several domains in which this general expansion [of its knowledge bases] is occurring are discussed, and the ways in which this expansion is being conducted are described. ... Since the acquisition of the necessary knowledge is usually gradual, so too is the expansion of the knowledge-based program into its problem domain.”

Total System Design (p. 15) “Our presentation of the [Total System Design] framework begins with an overview of its stages, phases and steps, followed by a discussion of hardware–software tradeoffs. We then show the development of a system design methodology for a particular type of company and a particular application area.”

Local Satellites (p. 30) “In this article we describe an interconnection network architecture for connecting Hyperchannel local networks through satellite links. By way of introduction, we review local Hyperchannel network architecture on the protocol level; we then explain the operation of satellite-connected Hyperchannel networks.”

Interactive Types (p. 40) “This article reports on the recent application of interactive computer graphic techniques to type design and manufacture, advances that will encourage the production of beautiful letterforms in the current era of high-speed digital image-setting technologies.”

Faster Arithmetic (p. 50) “Digital systems structured into residue arithmetic units might play an important role in ultra-speed, dedicated, real-time systems that support pure parallel processing of integer-valued data. It is a ‘carry-free’ system that performs addition, subtraction, and multiplication as concurrent (parallel) operations, sidestepping one of the principal arithmetic delays—managing carry information.”

Database Design (p. 64) “The design method presented here is based on [the] philosophy that database design must be done ‘from the outside in.’ We must analyze the proposed system’s environment and proceed progressively inward toward the computer implementation of the application. In most cases the analyst is then directly exposed to the requirements, which is really the key to a successful system design, if the system is to operate effectively within a particular environment.”

Professional Software (p. 82) “Of course, as graduates with BS, MS, and PhD degrees, we all know we are competent and qualified. ... But our own lives and property depend on those other software engineers who are writing programs to control our cars, our ovens, our bank accounts, our stock market accounts, our trains, our airplanes, etc.”

Haptic Input (p. 92) “Microtouch Systems has announced the Point-1, a touch-sensitive monitor for the IBM PC and other personal computers. Users position the cursor, select from menus, and manipulate graphics by touching the CRT screen instead of using the keyboard or other pointing devices.”

Fingerprint Perfection (p. 99) “Criminals who think they have executed the perfect crime might have something new to worry about. San Francisco has installed a new fingerprint identification system that allows city police to clarify, match, and trace the origin of even small, partial fingerprints found at the scene of a crime ... at a rate of 650 prints per second.”

Lip Writing (p. 99) “Universe Electric Research ... has developed an animation-simulation program that converts typed sentences into life-like animated mouth movements. The Lip Reader Trainer provides the instructors and parents with a flexible and easy-to-use aid for teaching lip reading to the hearing impaired.”

Diagnostic computers (p. 106) “Several computers have been in development in teaching hospitals for years, but they have all been research models or prototypes. Now electronic diagnostic systems are going commercial, and the first ones are expected to be marketed shortly by Medicomp of Fairfax, Virginia.”
Letter (p. 4) “The authors advance the idea that Web users—either as searchers for or suppliers of goods, services, or information—have an intrinsic right either to find what they need or to be found. Further, they should be able to do this without having to acquire any special skills or knowledge. However, everything in life requires learning—I can’t play the piano, but I don’t blame Steinway.”

The Mobile Internet (p. 16) “Now, however, proponents and many industry observers are touting WAP (the Wireless Application Protocol) as the technology that will become the standardized basis and future of the mobile Internet.”

Software’s Future (p. 33) “Abstract by nature, software’s apparently limitless flexibility is both its greatest strength and greatest weakness. We can no longer afford to let this increasingly critical component of the Information Age’s infrastructure proliferate in the form of ill-conceived, hastily crafted, and failure-prone products. The [National Science Foundation] has taken the first steps toward grasping the reins of software development and regaining control not only of the development process but also of the role software will play in our future.”

Respectable Software (p. 35) “A recognized engineering profession must have an established body of knowledge and skill that its practitioners understand and use consistently. After 30 years, there is still a wide gap between the best and the typical software engineering practices. To close this gap, we need a deeper partnership among industry, academia, and professional societies.”

Software Topics (p. 44) “Our survey reinforces current perceptions about the importance of some topics, but it also highlights topics that are sometimes underemphasized or overemphasized. For example, the survey results indicate that education programs emphasize mathematics, chemistry, and physics more than their importance to practitioners seems to warrant; furthermore, practitioners tend to forget this material. On the other hand, there is a clear knowledge gap and a reliance on on-the-job learning for topics related to software processes, people skills, and human–computer interaction.”

The Death of Data (p. 52) “Most information depreciates over time, so keeping Web pages current presents new design challenges. This article quantifies what ‘current’ means for Web search engines and estimates how often they must reindex the Web to keep current with its changing pages and structure.”

Network Simulation (p. 59) “Network researchers must test Internet protocols under varied conditions to determine whether they are robust and reliable. The Virtual InterNetwork Testbed (VINT) project has enhanced its network simulator and related software to provide several practical innovations that broaden the conditions under which researchers can evaluate network protocols.”

Firmware (p. 68) “Exhaustive verification—a technique that implicitly checks all possible computations—is a practical alternative for ensuring the correctness of embedded software. Our work demonstrates that the visualState commercial design tool can verify even the largest industrial applications—comprising more than 1,000 concurrent components—in a few minutes on a standard PC.”

Internet Productivity (p. 102) “Forward-thinking companies are leveraging the Internet’s massive public technology infrastructure to create new value for their stakeholders and to attain new heights in productivity. While the Internet might appear to be just another technology wave like the client–server phenomenon in the business world in the early 1990s or the enterprise resource planning movement in the late 1990s, its scope and potential impact on the global economy are much larger.”

Modern Monitors (p. 106) “Distributed sensor networks (DSNs)—consisting of many small, low-cost, spatially dispersed, communicating nodes—have recently been proposed for many applications, such as area surveillance and environmental monitoring. Trends in integrated electronics ... now allow the construction of sensor nodes with signal processing, wireless communications, power sources, and synchronization—all packaged into inexpensive miniature devices.”

Morbid Money (p. 112) “Several upstart e-commerce companies are poised to radically alter the abstract entity we call ‘money.’ X.com (formerly Confinity.com before it merged with X.com) sends money through email via its PayPal.com service—Tele-Vend.com turns your mobile phone into a credit card, and Beenz.com prints e-money like some kind of out-of-control bean counter. Are these just examples of funny money, or the end of money as we know it? I believe it’s the latter, and that the prospects for massive disintermediation threaten the future of conventional money.”

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