FEBRUARY 1968
In its early years, Computer was published bimonthly. Stay tuned for more interesting historical highlights in the upcoming March 2018 issue.

FEBRUARY 1993
www.computer.org/csdl/mags/co/1993/02/index.html

Distributed Computing with High-Speed Optical Networks (p. 8) “Lightwave (photonic) technology based on fiber-optic waveguides is already well established for long-distance voice communication systems. Typical data rates for these fiber-optic communication channels range from 1.5 megabits per second (Mbps) to well over 1 gigabit per second (Gbps). Future lightwave transmission systems using wavelength-division multiplexing (WDM) techniques will allow a single fiber-optic cable to carry multiple high-speed communication channels with a combined data rate in the range of Tera (1012) bits per second (Tbps).” [Editor’s note: These advances led to the development of cloud—and more recently, edge—computing facilities in which local and remote high-speed communications are essential to ensure the necessary performance.]

A Cataloging Framework for Software Development Methods (p. 34) “This framework provides a basis for comparing and evaluating software development methods. With it, practitioners and methodologists can describe and rate [a software development’s (SDM’s)] support for 21 properties. A general framework for cataloging SDMs provides the practitioner with input for selecting a method, or collection of methods, for an application. For the methodologist, it highlights the properties of existing methods, supports commonality analysis, and identifies areas for method enhancement.” [Editor’s note: Although this framework might help in the selection of an SDM for specific applications, I think they’re much more valuable for checking and refining SDM methodologies as well as the processes and policies already in place at a company.]

Object-Oriented Database Management Systems: Evolution and Performance Issues (p. 48) “Many of today’s applications are workstation-based and serve relatively few users. These applications include design databases, multimedia systems, and knowledge bases. They involve complex data and operations. For example, a design database requires the support of composite objects and different versions of the same object. A multimedia database might contain variable-length text, graphics, images, and audio and video data. Finally, a knowledge-base system requires data rich in semantics. … Object-oriented database management systems show promise for meeting the new database application requirements. … Research in object-oriented DBMSs is still in an early stage compared to relational systems.” [Editor’s note: Research in object-oriented database systems continued for a number of years, but because real commercial success didn’t materialize, interest shifted to other models. Wikipedia (en.wikipedia.org/wiki/Category:Database_management_systems) provides descriptions of all kinds of such systems.]

A Survey of Wormhole Routing Techniques in Direct Networks (p. 62) “Efficient routing of messages is critical to the performance of direct network systems. The popular wormhole routing technique faces several challenges—particularly flow control and deadlock avoidance. … An adaptive routing algorithm for a wormhole-routed network, however, must address the deadlock issue. To do so often requires the use of additional channels; in particular, some adjacent nodes must be connected by multiple pairs of opposite unidirectional channels. … Wormhole routing, the most promising switching technique, has been adopted in several new massively parallel computers. However, wormhole routing also raises unique technical challenges in routing and flow control—in particular, the development of routing algorithms that avoid deadlock. The problem is complicated by the need for adaptive routing and reconfigurable topologies.” [Editor’s note: Many of the issues discussed had to be solved to allow the development of today’s massively parallel computing centers, which have not merely thousands, but millions of components, for
example, Amazon, Google, and various government agencies. This article offers a good introduction to the issues that had to be settled to pave the way for massively computing centers as well as high-performance MPPs for scientific research.]

Three Views of Virtual Reality: An Overview (p. 79) “The two major differences between virtual reality [VR] and motion pictures are that VR technology can create a much stronger illusion and that VR is an interactive not a passive experience. ... Current tracking devices use ultrasound or electromagnetic technology and suffer from limited range and accuracy; typical ranges are 1 to 2 meter-radius spheres, with accuracy within several centimeters. Most bothersome is the lag—the time between user movement and system response.” [Editor’s note: Progress in VR systems has yielded not only serious applications in industry and the military but also led to wide usage in today’s sports, entertainment, and gaming arenas.]

The Open Channel: Computer Technology Policy Advice from a Techie Maven (p. 128) “But the new State Computers—and MPPs [massively parallel processors] in general—run on parallel software. This kind of software is more costly to develop. Unique training is necessary, but the academic community finds this specialty uninteresting. Mr. Vice President [Al Gore], the US needs MPPs to authenticate your policy decisions on global warming and ozone depletion, pharmaceutical drug design for resistant bacteria strains, smart highways and vehicles, and improved vehicle fuel efficiency, to name a few. ... To support this education effort, the government should grant universities funds to revise curricula and acquire small-scale, inexpensive MPPs as training and research platforms.” [Editor’s note: MPP funding did come along (and is still provided today), but most massively parallel processing is now done by massive clusters of tightly interacting cheap processors and storage devices. Amazon, Google, and other Internet companies rely on such architectures.]