

From the Editor's Desk



Jeffrey R. Yost
Editor in Chief

Last month Dr. Lars Heide of the Copenhagen Business School was named the new editor in chief of the *Annals*, to begin officially on 1 January 2012. Thus, I will be completing my second and final term as editor in chief of the *Annals* on 31 December 2011. Lars is a member of the *Annals* editorial board and has made strong contributions to the literature on the history of computing for more than two decades. His latest book, *Punched-Card Systems and the Early Information Explosion, 1880–1945* (Johns Hopkins Univ. Press, 2009), is a work of great depth and insight and is easily the finest book written on the important topic of punched-card systems. He has written numerous important articles for the *Annals* over the years, including one in this issue.

I have greatly enjoyed my two terms as editor in chief and am very pleased to be handing the journal off to such an accomplished and talented successor. Lars and I have begun work on transitional matters, and I know that given his knowledge, skill, and judgment, the *Annals* has an extremely bright future.

Arpanet History

In the 1960s, the Advanced Research Projects Agency (ARPA) Information Processing Techniques Office (IPTO) had a fundamental role in fostering the growth of computer science in the core areas of graphics, time sharing, networking, and artificial intelligence.

IPTO's founding director, J.C.R. Licklider, had shown an interest in networking research from the start of his tenure with IPTO, but it was not until the late 1960s, under IPTO Director Robert Taylor, that the Arpanet project began. At this time, the US Department of Defense was placing increasing emphasis on direct military applications of its research expenditures. Stephen J. Lukasik, ARPA's director beginning in 1971, authorized most of the expenditures for the Arpanet.

In his enlightening article, "Why the Arpanet Was Built," Lukasik explores the basis and context for these DoD expenditures to create the first operational packet-switching computer network. As Lukasik points out, he and others at ARPA recognized this research would have far broader implications, but their clear rationale for moving forward to fund the development of the network was for military command, survivability of communications to control nuclear forces, and military tactical decision making.

Also in this Issue

In an important article that focuses on the first half-century of the American key-set office machine trade, "Scale and Scope in American Key-Set Office Machine Dynamics, 1880s–1930s," Lars Heide argues that this industry, which emerged in the 1880s, reached a stage of maturity and slow growth in the early interwar years and began to collapse in the face of electronics by the start of the 1960s. He contrasts the relatively stagnant key-set office machine industry between the 1920s and the 1950s with the thriving, steadily innovating punched-card tabulation machine industry led by IBM.

Bernardo Bátiz-Lazo and Robert J.K. Reid's "The Development of Cash Dispensing Technology in the UK" explores the development of cash-dispensing machines in a rich and carefully crafted article. Their analysis contributes to the broader topics of user-driven innovation (in this case, the needs of bankers to offer off-hours services) and embedded computing technologies in analyzing the three

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earliest projects to develop and implement cash-dispensing machines in the UK.

A team consisting of research scientists and engineers from the Lawrence Berkeley National Laboratory, industry, and academia—Jonathan G. Koomey, Stephen Berard, Marla Sanchez, and Henry Wong—provide a compelling examination of historical trends of electrical efficiency in computing in “Implications of Historical Trends in the Electrical Efficiency of Computing.” They demonstrate how gains in electrical efficiency in computing (computations per kilowatt hour) substantially exceeded performance growth in the vacuum-tube era and have roughly kept pace with the rapid performance advances (doubling every 1.5 years) beginning in 1975. Despite massive gains in efficiency, they point out that achievements have fallen far short of Richard Feynman’s identification of the potential for a 100 billion factor improvement in computations per kilowatt hour—leaving room for far more advances in computational energy efficiency in the future.

Finally, Christian Sandström’s “Hasselblad and the Shift to Digital Imaging” traces the history of Swedish camera manufacturer Hasselblad’s early and continuing work in digital imaging—from developing the telephoto transmitter Dixel in the 1980s and the 6 megapixel sensor in the 1990s to producing full digital camera systems over the past decade. He documents both the successes and challenges for Hasselblad as digital imaging became increasingly prevalent to the camera industry and places this case within the larger context of disruptive technologies and industry change.

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cn Selected CS articles and columns are also available for free at <http://ComputingNow.computer.org>.

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