The IEEE Computer Society offers a lineup of 12 peer-reviewed technical magazines that cover cutting-edge topics in computing including scientific applications, design and test, security, Internet computing, machine intelligence, digital graphics, and computer history. Select articles from recent issues of Computer Society magazines are highlighted below.

Software

The lean paradigm of product development originated in manufacturing, with clear goals to empower teams, reduce waste, optimize work streams, and above all keep market and customer needs as the primary decision driver end to end. Lean thinking has since penetrated many industries. In an issue that focuses on “Lean Software Development,” the guest editors of Software’s September/October issue ask, What design principles deliver value, and how should they be introduced to best manage change? Five peer-reviewed articles and a point/counterpoint discussion provide answers to these questions.

Profiling means making predictions about likely user behavior on the basis of collected characteristics and activities. In S&P’s July/August issue, Shari Lawrence Pfleeger of Dartmouth College and Marc Rogers of Purdue University lead researchers from various disciplines in a roundtable discussion to answer the question, “Does Profiling Make Us More Secure?”

“Toward an Open Cloud Standard” is the first article in Internet Computing’s July/August special issue on programmatic interfaces for Web applications. Together with colleagues from Platform Computing and the Technische Universität Dortmund, Andy Edmonds of Intel Labs Europe and Alexis Richardson of VMware, cochairs of the Open Grid Forum’s working group on the Open Cloud Computing Interface (OCCI), describe the OCCI development architecture for bringing standardized protocols and interfaces to the cloud.

According to “Mobile Payments in Emerging Markets” in IT Pro’s July/August special issue on IT in emerging markets, mobile phone penetration in the developing world reached 79 percent in 2011. The article spotlights m-payment services—that is, financial services conducted through mobile devices—which have been a key driver of socioeconomic development in emerging economies such as Africa, Asia, and Latin America. Nir Kshetri of the University of North Carolina and Sharad Acharya of First Citizens Bank, Raleigh, survey the factors driving m-payment services and highlight successful services, such as Kenya’s M-Pesa system, which supports person-to-person fund transfers for users who don’t have bank accounts.

Visual analytics (VA) is the science of analytical reasoning facilitated by interactive visual interfaces. CG&A introduced the term in its September/October 2004 issue. The theme of CG&A’s July/August special issue is extreme-scale visual analytics. Noting that much of today’s cutting-edge R&D investment applies to solving exascale (10^18) problems, guest editors Pat Chung Wong of Pacific Northwest National Laboratory, Han-Wei Shen of the Ohio State University, and Valerio Pascucci of the University of Utah introduce four feature articles addressing the unique VA challenges of extreme-scale datasets. The special issue also includes a summary describing the top 10 challenges in extreme-scale visual analytics.
Interactive multidimensional projections can be effective visualization tools. Their popularity is on the rise, motivated largely by their ability to handle large datasets embedded in high-dimensional attribute spaces. In “User-Centered Multidimensional Projection Techniques” in the July/August issue of CiSE, researchers from Universidade de São Paulo, Brazil, and New York University discuss several approaches to using multidimensional projections for handling massive datasets.

Government data includes authoritative and valuable information about our society, but public access to it remains challenging, largely due to the heterogeneity and complexity of the public information ecosystem. Intelligent System’s May/June special issue, “Linked Open Government Data,” addresses these challenges in seven feature articles contributed by key government practitioners and academic thought leaders from six countries. Together, the articles give a snapshot of worldwide efforts to make government data available and linkable on the Web.

“What Is Happening to Power, Performance, and Software?” is one of 12 articles in Micro’s May/June ninth annual “Top Picks from Computer Architecture Conferences” issue. Researchers from the University of Washington, Australian National University, and Microsoft Research systematically measured the power, performance, and energy characteristics of software and hardware across a range of the past decade’s processors, technologies, and workloads. Their analyses shed new light on the clash of two trends during this period: the rise of parallel processors in response to technology constraints on power, clock speed, and wire delay; and the rise of managed, high-level programming languages.

MultiMedia’s July-September special issue, “Large-Scale Multimedia Data Collections,” addresses the data management challenges arising with the exponential growth of image content available through mobile devices and social media applications. Guest editors Benoit Huet of Eurecom, Tat-Seng Chua of the National University of Singapore, and Alexander Haulptmann of Carnegie Mellon University introduce five articles that identify use cases and design tasks to advance research in this area and generate high-quality, ground-truth multimedia datasets.

In “Cost-Aware Mobile Web Browsing” in Pervasive’s July-September issue, Sindhura Chava and her colleagues from New York University describe a mobile browsing framework that automatically adapts Web content as a function of a user’s data pricing plan and usage levels. Aiming to reduce browsing costs for mobile users, especially in developing regions of the world, the authors based their approach on dynamically computing a cost quota for each webpage request and forwarding the best possible version of the page for a given data allowance.

“Engineering Change: The Appropriation of Computer Technology at Grupo ICA in Mexico (1965-1971)” recounts the difficulties of Mexico’s largest civil engineering company in harvesting business opportunities from its advanced computer implementations in the late 1960s and 1970s. Bernardo Báez-Lazo of Bangor University, Wales, and Thomas Haigh of the University of Wisconsin-Milwaukee trace the influence of personnel and company practices, examine the development of applications, and explore the ICA computer center’s story within the broader company history over a 15-year period.

NEXT ISSUE
DYNAMIC SOFTWARE PRODUCT LINES