The IEEE Computer Society offers a lineup of 13 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

Mobile devices have steadily gained acceptance as a multimedia platform. Although the choice of development platform is largely market-driven, it also depends on the characteristics of available platforms and the requirements of particular applications. To illuminate the status and trends in current development platforms, Damianos Gavalas and Daphne Economou reviewed and compared four popular mobile-application runtime environments with respect to various quantitative and qualitative criteria in “Development Platforms for Mobile Applications: Status and Trends.” They also developed a simple game application and implemented it on all four platforms as a case study for highlighting the main characteristics and relative merits and shortcomings of each platform.

Intelligent Systems

Facing the critical mission of international security and various data and technical challenges, there is a pressing need to develop a science of security informatics. The main objective is the development of advanced information technologies, systems, algorithms, and databases for security-related applications using an integrated technological, organizational, and policy-based approach. Intelligent systems have much to contribute for this emerging field. To learn more, read “AI and Security Informatics,” in the September/October 2010 issue of IS.

GISs are becoming an important framework for many applications. In “Open Source for Enterprise Geographic Information Systems,” David A. Garbin and James L. Fisher of Noblis describe their experience implementing an end-to-end GIS process using only open source components. The article is part of IT Pro’s November/December 2010 special issue on open source software. It includes a review of GIS data types and formats and describes open source tools available for each function. “Using these sources as a departure point,” they conclude, “any enterprise should be able to tailor a GIS environment that will continue to serve a variety of processing needs for the foreseeable future.”

Computer Graphics

Guest editor Holly Rushmeier of Yale University introduces a special issue that explores recent advances in the acquisition and use of camera images in conjunction with computer graphics techniques. She provides examples of the many ways these advances are expanding our capability to author and share visual experiences. Read “Introduction to the Special Issue: Camera Culture” in the January/February 2011 issue of CG&A.

As educators, it’s challenging to develop and maintain courseware that’s current and accurate and that also motivates students, especially in rapidly changing fields such as electrical and computer engineering. Professors at the University of Wyoming developed the For Students by Students approach to create courseware for both undergraduates and graduate students, and they’ve used it for more than a decade. Their approach’s basic premise is that highly motivated students are well prepared to develop courseware and teaching aids for their fellow students. Read “For Students by Students” by Steven Barrett and Cameron H.G. Wright in the November/December 2010 issue of CiSE.

As part of S&F’s November/December 2010 special issue on cloud computing, guest editors Iván Arce and Anup Ghosh put together a roundtable discussion in which readers can learn about cloud computing security from those who are on the front lines, providing services and looking at the real-world threats and requirements from the market.
Panelists include Eric Grosse, Google; John Howie, Microsoft; James Ransome, Cisco; Jim Reavis, Cloud Security Alliance; and Steve Schmidt, Amazon Web Services.

Advertising will be the next major application for ubiquitous computing. Ads will support ubiquitous computing, and ubiquitous computing will support advertisers with ad targeting, ad feedback, customer awareness, and privacy. Advertisers are already adopting certain ubiquitous computing technologies, according to Microsoft Research’s John Krumm, in “Ubiquitous Advertising: The Killer Application for the 21st Century,” which appears in the January-March 2011 issue of PwC.

Information overload occurs when the information available exceeds the user’s ability to process it. To manage information overload, a user is required to discriminate among useful, redundant, incorrect, and meaningless information. From a computer science perspective, this means we must provide users with a combination of techniques and tools for collecting, grouping, classifying, selecting, indexing, ranking, and filtering useful information. The articles in this special issue of IC show four different facets of the information overload problem by providing the readers with a big picture of the main research outcomes in this topic. Read “Guest Editors’ Introduction: Information Overload” in the November/December 2010 issue of IC.

The traditional way to achieve power efficiency in chip designs is to optimize performance in application-specific ICs, but this approach has become prohibitively expensive. In “Rethinking Digital Design: Why Design Must Change,” in the November/December 2010 issue of Micro, researchers from Stanford University, Duke University, and Hicamp Systems describe their work to create chip generators—domain-specific architectural templates that codify design knowledge and tradeoffs. Chip generators occupy the design space between power-inefficient, general-purpose designs and expensive, application-specific designs.

“Crowdsourcing What Is Where: Community-Contributed Photos as Volunteered Geographic Information” is one of five articles in MultiMedia’s October-December 2010 issue on knowledge discovery from community-contributed multimedia. Author Shawn Newsam of the University of California, Merced, surveys work to leverage large image collections as volunteered geographic information. Newsam describes three classes of multimedia analysis problems to give a snapshot of the state of the art of knowledge discovery via georeferenced social media.

“The Dawn of Predictive Chip Yield Design: Along and Beyond the Memory Lane” is one of five articles in D&T’s November/December 2010 theme issue on postfabrication calibration and repair. Authors from three different IBM research groups describe a statistical simulation technique that distorts the natural Monte Carlo function to produce more samples in important regions of the design space. This approach supports the yield-driven design of memories, peripheral circuits, and logic blocks.

The lead article in Annals’ October-December 2010 issue contributes to an emerging literature on both labor and gender in computing history. In “Only the Clothes Changed: Women Operators in British Computing and Advertising, 1950–1970,” Marie Hicks of Duke University traces the relationship between advertising images of women used to sell data-processing equipment and the early feminized labor force in Great Britain. The article includes a lengthy reference list in support of her thesis that the use of women in early computing and advertising hurt their long-term professional position by reflecting and helping maintain their role as low-cost, unskilled workers.

Editor: Bob Ward, Computer; bnward@computer.org

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