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**

The basic definition of refactoring—the process of making small behavior-preserving transformations—has remained the same over time, but its intent has varied considerably from the original purpose of improving code readability, extensibility, and maintainability. For example, an HTML refactoring such as “Turn on autocomplete” doesn’t improve the code, but it makes a Web form easier to use. This shifts the refactoring’s intent toward improving software product usability. In *IEEE Software’s* May/June issue, the authors of “Refactoring for Usability in Web Applications” assert that it’s important to link refactorings not only to the code problems they can eliminate but also to the specific quality attributes they aim to improve.

**Intelligent Systems**

Users often have no direct knowledge of their intelligent devices’ algorithms, data requirements, limitations, and representations. Poor user interface design, users’ lack of understanding, inadequate mental models, or incorrect expectations can cause problems. Training can help. The Experiential User Guide described in “Improving Users’ Mental Models of Intelligent Software Tools” in the March/April 2011 issue of *IS addresses the genuine cognitive challenges that both novice and experienced users have with today’s complex, intelligent software tools.*

**Computer Graphics**

In “Practical Game Design and Development Pedagogy,” in the May/June issue of *CG&A*, author Paul J. Diefenbach of Drexel University notes several recurring observations about student tendencies that have influenced the structure and focus of Drexel University’s Game Development Workshops. Originally, the game-design part of the workshops built upon previously taught basic game theory, gameplay critique, and nonlinear-story skills. Now, it also addresses vaguely envisioned student game concepts and pitches. The game-development part of the workshops, which has employed agile development, is now structured to guide students with little experience in long-term project planning.

**Computing**

“Trends in High-Performance Computing.” in the May/June issue of *CiSE*, looks at recent advances in supercomputer technologies. Supercomputer architectures have evolved from early custom-designed systems to the current clusters of commodity multisocket, multicore systems. Supercomputers are usually designed to achieve the highest possible performance in terms of the number of 64-bit floating-point operations per second. Twice a year, the supercomputing community ranks the systems and produces the Top-500 list, which shows the world’s 500 highest performing machines. The technologies used in the top-ranked machines give a good indication of architecture trends.

**Security & Privacy**

In “Shouldn’t All Security Be Usable?,” authors Mary Frances Theofanos of the US National Institute of Standards and Technology and Shari Lawrence Pfleeger of Dartmouth College introduce S&P’s March/April special issue on usability and security and provide a description of how usable security has been transformed from a desirable system property to a rich area of serious research. They explain how usability testing differs from other kinds of software testing, describe some of the key papers on which current research builds, and summarize the four articles in the special issue.
The retail experience is undergoing significant changes due to a confluence of pervasive computing technologies, such as affordable smartphones with a plethora of retail applications, social media, sensing and analytics, and wireless technologies. In “Pervasive Retail,” in the April-June issue of Pvc, guest editors Chandra Narayanawami, Antonio Krüger, and Natalia Marmasse introduce three articles that examine some of the opportunities and challenges in the pervasive retail space.

The May/June IC is a special issue on security and privacy in social networks. “Social networks’ security and privacy requirements still aren’t well understood or fully defined,” write guest editors Gail-Joon Ahn of Arizona State University, Mohamed Shehab of the University of North Carolina at Charlotte, and Anna Squicciarini of Pennsylvania State University in “Security and Privacy in Social Networks.” “Nevertheless, it’s clear that they’ll be quite different from classic security and privacy requirements because social networks involve user-centric concerns and allow multiple users to specify security policies on shared data.” The issue includes four articles encompassing research advances and state-of-the-art technologies for addressing these requirements.

Micro’s annual March/April “Hot Chips” issue features articles based on papers from the August 2010 Hot Chips 22 conference, a leading forum for presenting new processor architectures and system-enabling aspects of silicon such as software, I/O, and packaging. In their introduction, “Hot Chips 22” guest editors Jose Renau of the University of California, Santa Cruz, and Will Eatherton of Juniper Networks highlight eight articles—three on new processor architectures from IBM and AMD, four on high-performance computing chips and systems, and one on a 45-nm multicore research prototype that uses dark silicon to execute general-purpose smartphone applications that use 11 times less energy than today’s most energy-efficient designs.

Mobile and cloud computing are relatively new computing platforms. In “Virtualized Screen: A Third Element for Cloud-Mobile Convergence,” in MultiMedia’s April-June issue, authors Yan Lu, Shipeung Li, and Huifeng Shen of Microsoft Research Asia illustrate the advantages of an approach with two applications, Cloud Browser and Cloud Phone. The article describes an approach to rendering computer screens in the cloud and delivering them as images to the client for interactive display.

Guest editor Bruce Potter of Ponte Technologies summarizes the evolution and challenges of securing information systems over the past few decades in “Coming to Grips with Security,” his introduction to IT Pro’s May/June special issue on IT security. “The one constant,” Potter writes, “is that attackers will change tactics based on our evolving defenses.” The issue features three articles addressing new ways of thinking about IT security, including virtual machine introspection, a community knowledge base, and a forensic Web services framework.

“Functional verification is widely acknowledged as a significant bottleneck in today’s SoC design methodology,” write guest editors Prabhat Mishra of the University of Florida, Zeljko Zilic of McGill University, and Sandeep Shukla of Virginia Tech in “Multicore SoC Validation with Transaction-Level Models,” their introduction to D&T’s May/June issue. They present four articles that highlight challenges and recent trends in multicore SoC validation using transaction-level models. The articles cover theoretical as well as practical aspects of high-level validation to capture as many bugs as possible early in the design process and thereby drastically reduce the overall validation effort.

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The April-June issue of Annals presents five feature articles that editor in chief Jeffrey Yost of the Charles Babbage Institute and editorial board member William Aspray of Indiana University invited in conjunction with a 2010 workshop. Their purpose was to extend Annals’ content to include authors who hadn’t previously written for the magazine but who were conducting cutting-edge research on largely unstudied, but significant, topics in computing history. The diverse articles include histories of evidence-based medicine, slot-machine digitization, hearing-aid contributions to electronics miniaturization, and PC “tinkering.” Attention to computer users and user-driven innovation emerges as a common theme among the articles, offering a new way of looking at the history of computing.

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