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

**Software**

Programming in both top-down and test-driven software development is incremental, yet modern integrated development environments are mostly incapable of supporting a pure incremental programming style. “Programming with Ghosts,” a feature article in Software’s January/February issue, addresses this issue through a simple reification of undefined entities according to their usage and a progressive refinement of them as a program is elaborated. Authors Oscar Callaú and Éric Tanter of the University of Chile have developed a Ghost plug-in for Eclipse that’s available online as a proof of concept, along with a Ghost extension for Smalltalk Pharo that shows the potential of Ghosts for dynamic languages.

**Internet Computing**

In “Abstraction, Federation, and Scalability” in IC’s January/February issue, Vint Cerf muses on the properties of structures that make them scalable. “Design principles emerge through representing and analyzing systems at the right abstraction level,” he writes. Cerf argues for more curricular emphasis on systems architecture and systems engineering—the disciplines that try to understand root behaviors of complex, artificial systems—and concludes that “anyone looking for a dissertation topic will not be disappointed at the richness of this research area.”

**Intelligent Systems**

Coalition operations have emerged as a key feature of military and humanitarian interventions over the past two decades. These coalitions usually consist of two or more nations or agencies acting together to accomplish some major task in either wartime or peacetime. In “Knowledge Systems for Coalition Operations” in IS’s January/February special issue, the guest editors introduce seven articles that cover work by academic, government, and industry researchers who are developing knowledge systems to support such operations. From information sharing to collective sense making and coordination, this issue of IS presents a snapshot of the active work being done in this growing field.

**IT Professional**

IT Pro’s January/February 2013 special issue on green IT follows up its January/February 2011 issue on the same topic. In this year’s introduction, “Fostering Green IT,” the guest editors distinguish the “greening of IT”—reengineering IT products and processes to improve energy efficiency within the context of creating business value—from “greening by IT”—innovating IT services to address the global environmental problems of society.
Researchers from the Korea Advanced Institute of Science and Technology are evolving a line of multicore processors that exploit an attention-based algorithm and network-on-chip-based architecture for outstanding object-recognition performance and energy efficiency. In “Low-Power, Real-Time Object-Recognition Processors for Mobile Vision Systems” in *Micro’s* November/December 2012 issue, they describe the Basic On-Chip Network—Vision (BONE-V) architecture in detail and compare a BONE-V prototype’s performance with six commercial state-of-the-art processors.

Augmented reality (AR) applications commonly use markers for detecting and tracking virtual objects in an environment, but interaction with the objects is limited because it requires users to know how to design and program in 3D. In “Magic Cards: A New Augmented Reality Approach” in *CG&A*’s January/February issue, Olivier Demuynck and José Manuel Menéndez of the Universidad Politécnica de Madrid describe a robust, marker-based application that lets users create an unlimited number of virtual objects in a few simple steps. Magic Cards encode shape and color information but do not require using a 3D model previously stored in memory.

A cheap way to speed up image-reconstruction software is to use modern graphics hardware that can execute algorithms in a massively parallel manner. In “The Agile Library for Biomedical Image Reconstruction Using GPU Acceleration,” from *CiSE*’s January/February issue, Austrian researchers discuss Agile, an open source library designed for various image reconstruction applications in biomedical sciences. Agile’s modular, object-oriented, and templated design eases integrating the library into user code and represents a major step forward in producing faster image-reconstruction algorithms.

MultiMedia’s January–March special issue, “3D Imaging Techniques and Multimedia Applications,” features five articles that describe recent advances in 3D topics ranging from scene acquisition and understanding to visualization. The guest editors also consider the impact of low-cost depth cameras such as Microsoft’s Kinect, as well as advances in 3D data visualization and novel multimedia compression and transmission techniques that can provide “the missing link” between acquisition and visualization, “making remote immersive visualization of complex 3D scenes possible.”

A sustainable home is more than a green building; it’s a living experience that encourages occupants to use resources more effectively. In *Pervasive*’s January–March issue, researchers from Simon Fraser University in Canada present “A Smarter Smart Home: Case Studies of Ambient Intelligence.” They argue that the technological support for sustainable home use lies in more subtle and contextually appropriate interventions, integrated models of occupant behavior, hybrid levels of automated control, and ambient sensing for localized decisions. Suggesting that singular approaches to sustainable living cannot be tested in isolation, they contend that future work in the field should be deployed and studied in situ.

Hugh Darwen worked in software development at IBM from 1967 to 2004. In the 1970s, Darwen took an internal course with Christopher J. Date, which became the beginning a long professional association that included coauthoring several books on relational database management systems (RDBMSs). Date was an early proponent of Edgar F. Codd’s relational data model, which he had developed while working at IBM. In “The Relational Model: Beginning of an Era” in the October-December 2012 issue of *Annals*, Darwen presents an introduction to RDBMSs, discussing the value of Codd’s model, Date’s contributions, the model’s effect on industry, and possible future developments.