Computer Highlights Society Magazines

The IEEE Computer Society’s lineup of 13 peer-reviewed technical magazines covers cutting-edge topics in computing, including scientific applications, Internet computing, machine intelligence, pervasive computing, security and privacy, digital graphics, cloud computing, and computer history. Here, we highlight recent issues of other Computer Society magazines.

Software

Changes in the industry are making the software architect’s job more challenging. Key drivers are the growing role of software in systems; the increasing emphasis on reuse, agility, and testability during development; and several quality-related factors affected more and more by architectural choices, according to “The Changing Role of the Software Architect,” from IEEE Software’s November/December 2016 issue.

Network Function Virtualization (NFV) represents a series of technologies that let users virtualize the high-volume packet-processing functions that form the Internet’s core so that the functions can run on commodity cloud-computing platforms. NFV will spur innovation and enable the faster deployment of new services with less risk, according to IEEE Internet Computing’s November/December 2016 special issue on the topic.

“Risks,” from CiSE’s November/December 2016 issue, looks at how we address perceived and actual risks in scientific programming and how we can mitigate them from the technical and project-management perspectives.

Security & Privacy

Considerable work is taking place on the interface between cryptography practice and theory. The articles in IEEE S&P’s November/December 2016 special issue show that real-world cryptography no longer focuses only on the traditional aspects of communications security. The articles also demonstrate that practitioners are concerned about cryptography’s societal impacts and underlying social constructs.

Cloud Computing

Microservices address the problem of efficiently building and managing complex software systems. For medium-size systems, these services can reduce cost, improve quality, increase agility, and decrease time to market. For large cloud systems, they change the rules of the game. Despite its substantial benefits, a microservices architecture requires extra machinery, which can impose substantial costs. “The Economics of Microservices,” from IEEE Cloud Computing’s September/October 2016 issue, explores microservices’ costs and benefits.

Computer Graphics

Transforming data into effective and engaging visuals for use in compelling presentations is an emerging topic in information-visualization research. To achieve such a transformation, several data-analysis approaches offer a higher-order visualization of network-structured data that maps insights rather than raw data. Knowledge visualization in the form of small, focused diagrams can communicate insights as well as help analysts structure their reasoning process, according to “Network Visualization as a Higher-Order Visual Analysis Tool,” from CG&A’s November/December 2016 issue.

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“On Searching the Internet of Things: Requirements and Challenges,” from IEEE Intelligent Systems’ November/December 2016 issue, describes some of the requirements of and key challenges to building scalable and efficient search and discovery mechanisms for the Internet of Things.

The authors of “A Neural Network for Quality of Experience Estimation in Mobile Communications,” from IEEE MultiMedia’s October–December 2016 issue, say we need a new way to express multimedia-service users’ satisfaction: quality of experience (QoE). They consider key performance indicators (KPIs) and propose using neural networks to automatically classify these KPIs in terms of QoE.

IEEE Annals’ October–December 2016 issue is the second of two special issues on security based on the US National Science Foundation’s Computer Security History Workshop. The workshop gathered historians and technical experts at the Charles Babbage Institute in July 2014 and advanced scholarship on many critical aspects of computer-security history. This issue includes articles on the early histories of security vendor Symantec, intrusion-detection expert systems, edge cryptography, and the codevelopment of computer networks and cybersecurity.

The authors of “MIMO Wireless Power Transfer for Mobile Devices,” from IEEE Pervasive Computing’s October–December 2016 issue, discuss approaches to achieving control over the long-range wireless provision of power to devices using multiple input, multiple output (MIMO) concepts adapted from communications technology.

The digital technologies that underlie computers, robots, and smart devices are rapidly becoming more powerful, transforming organizations faster than in the past, and enabling them to achieve significant competitive advantages. IT Pro’s November/December 2016 special issue on digital innovation and transformation examines this important trend and looks at future opportunities.

IEEE Micro’s November/December 2016 special issue on the Internet of Things (IoT) includes articles on heterogeneous wireless sensor nodes for the IoT, heterogeneous distributed shared memory for lightweight IoT devices, and the feasibility of attribute-based encryption on IoT devices. There are also articles on emergent behaviors in the IoT, the visual IoT, and work on a self-learning and energy-neutral IoT.

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