Enabling RFID in Retail
pp. 25-30

George Roussos

In recent years, radio-frequency identification has evolved from an arcane business technology into a personal technology that directly affects individuals as they participate in their daily activities. Supermarkets and other retailers around the world are currently planning large-scale item-level deployments in consumer goods, leaving few citizens in developed societies unaffected as the technology silently retrieves and records product personal identifiers. Any retail RFID system necessarily involves tradeoffs between advanced functionality and privacy protection.

As businesses, users, and society in general struggle to cope with this plethora of new data sources and their numerous privacy implications, new mechanisms for commercial use of private data will appear, shopping behavior will change, and consumer activism will increase.

Energy-Aware User Interfaces and Energy-Adaptive Displays
pp. 31-38

Parthasarathy Ranganathan, Erik Geelhoed, Meera Manahan, and Ken Nicholas

Current approaches to reducing display power focus on aggressively turning off the entire display when not in use or designing systems with lower-quality or smaller-sized displays, which would compromise the user experience for all applications. In contrast, the authors address the possibility of controlling the display's *individual subportions* or power-consumption properties based on the end user's or application's specific requirements.

The authors' work shows that user interfaces must be designed with energy in mind and that such energy-aware interfaces can actually provide a good combination of energy benefits and greater ease of use.

Visualizing Information on Mobile Devices
pp. 40-45

Luca Chittaro

Continuous improvements in computer processing power and graphics capabilities have made it possible to incorporate a wide range of advanced visualization techniques in most computing application domains. Adapting these techniques to PDAs, cell phones, and other mobile devices could harness the power of visualization anytime, anywhere. Unfortunately, the mobility context and technical limitations such as small screen size make it impossible to simply port applications from desktop computers to mobile devices.

Because maps are familiar tools that play an important role in mobile location-based services, the author explores current trends in mobile visualization research in the context of a recently developed map-based application.

Quantifying Interactive User Experience on Thin Clients
pp. 46-52

Niraj Tolia, David G. Andersen, and M. Satyanarayanan

The authors describe an approach to quantifying the impact of network latency on interactive response and show that the adequacy of thin-client computing is highly variable and depends on both the application and available network quality. If near ideal network conditions can be guaranteed, thin clients offer a good computing experience. As network quality degrades, interactive performance suffers. S*tateless thick clients,* an alternative to thin-client computing, preserve many of the benefits of thin-client computing but eliminate its acute sensitivity to network latency.

Synchronization Options for Data Warehouse Designs
pp. 53-57

Isabel Cristina Italiano and João Eduardo Ferreira

With many enterprises now integrating just-in-time data, updating between transactional and analytical databases has become critical. To achieve maximum efficiency, some business models require feeding transactional data to a data warehouse in real time or at intermittent periods shorter than traditional static loadings.

Most data warehouse designs treat the entire warehouse as a single, homogeneous entity. However, as a data warehouse evolves, IT administrators must track the environment changes to adjust data warehouse synchronization. To address this problem, the authors present a framework that uses parameter sets to define the most suitable update option for a particular business model.

Key-Exchange Authentication Using Shared Secrets
pp. 58-66

Mohamad Badra and Ibrahim Hajjeh

The Transportation Layer Security specifications use public-key certificates for mutual authentication and key establishment. These certificates must be well maintained and based on a public-key infrastructure. Certificate use is a double-edged sword, however. Because certificates let the client and server authenticate each other, their processing time influences both entities' global performance.

The authors extend the TLS protocol with a new authentication scheme based on an out-of-band shared secret. Their method ensures an end-to-end authenticated session-key exchange and allows identity protection, perfect forward secrecy, and anonymity.