ARTICLE SUMMARIES

Integrating Biological Research through Web Services

pp. 26-31

Hong Tina Gao, Jane Huffman Hayes, and Henry Cai

At present, compatibility problems prevent researchers from cooperating in using bioinformatics to solve important biological problems.

Web services might be a way to solve this integration problem. Web technology provides a higher layer of abstraction that hides implementation details from applications so that each organization can concentrate on its own competence and still leverage the services other research groups provide.

To test the potential of a Web services solution, the authors implemented a microarray data mining system that uses Web services in *drug discovery*—a research process that attempts to identify new avenues for developing therapeutic drugs. Although their implementation focuses on a problem within the life sciences, they strongly believe that Web services could be a boon to any research field that requires analyzing and mining large volumes of data.

Socially Aware Computation and Communication

pp. 33-40

Alex (Sandy) Pentland

Most would agree that today's communication technology seems to be at war with human society. Pagers buzz, cell phones interrupt, and e-mail begs for attention. Technologists have responded with well-meaning solutions that ultimately fail because they ignore the core problem: Computers are socially ignorant.

A research group at MIT is taking the first steps toward quantifying social context in human communication. These researchers have developed three socially aware platforms that objectively measure several aspects of social context, including analyzing the speaker's tone of voice, facial movement, or gestures.

Designing Smart Artifacts for Smart Environments

pp. 41-49

Norbert A. Streitz, Carsten Röcker, Thorsten Prante, Daniel van Alphen, Richard Stenzel, and Carsten Magerkurth

The integration of information, communication, and sensing technologies into our everyday objects has created *smart environments*. Creating the *smart artifacts* that constitute these environments requires augmenting their standard functionality to support a new quality of interaction and behavior.

A *system-oriented, importunate smartness* approach creates an environment that gives individual smart artifacts or the environment itself certain self-directed actions based on previously collected information. For example, a space can be smart by having and exploiting knowledge about the persons and artifacts currently situated within its borders.

In contrast, a *people-oriented, empowering smartness* approach places the empowering function in the foreground by assuming that smart spaces make people smarter. This approach empowers users to make decisions and take actions as mature and responsible people.

Although in some cases it might be more efficient if the system doesn't ask for a user's feedback and confirmation at every step in an action chain, the overall design rationale should aim to keep the user in the loop and in control whenever possible.

The Gator Tech Smart House: A Programmable Pervasive Space

pp. 50-60

Sumi Helal, Hicham El-Zabadani, Youssef Kaddoura, Erwin Jansen, Jeffrey King, and William Mann

Many first-generation pervasive computing systems lack the ability to evolve as new technologies emerge or as an application domain matures. Integrating numerous heterogeneous elements is mostly a manual, ad hoc process. The environments are also closed, limiting development or extension to the original implementers.

To address this limitation, the University of Florida's Mobile and Pervasive Computing Laboratory is developing *programmable pervasive spaces* in which a smart space exists as both a runtime environment and a software library. Service discovery and gateway protocols automatically integrate system components using generic middleware that maintains a service definition for each sensor and actuator in the space. Programmers assemble services into composite applications, which third parties can easily implement or extend.

Web-Log-Driven Business Activity Monitoring

pp. 61-68

Savitha Srinivasan, Vikas Krishna, and Scott Holmes

Business process transformation defines a new level of business optimization that manifests as a range of industry-specific initiatives that bring processes, people, and information together to optimize efficiency. For example, BPT encompasses lights-out manufacturing, targeted treatment solutions, real-time risk management, and dynamic supply chains integrated with variable pricing

To examine how BPT can optimize an organization's processes, the authors describe a corporate initiative that was developed within IBM's supply chain organization to transform the import compliance process that supports the company's global logistics.