

Data Mining for Very Busy People pp. 22-29

Tim Menzies and Ying Hu

Most modern businesses can access mountains of data electronically—the trick is effectively using that data. In practice, this means summarizing large data sets to find the data that really matters. Most data miners are zealous hunters seeking detailed summaries and generating extensive and lengthy descriptions. The authors take a different approach and assume that busy people don't need—or can't use—complex models. Rather, they want only the data they need to achieve the most benefits.

Instead of finding extensive descriptions of things, their data mining tool hunts for a minimal difference set between things because they believe a list of essential differences is easier to read and understand than detailed descriptions.

Next-Generation Wearable Networks pp. 31-39

Roy L. Ashok and Dharma P. Agrawal

Increased research in microelectronics, wireless communications, and human-computer interaction—particularly augmented-reality applications—has made a symbiotic system technically feasible. Wearable computing, or *wearable*, focuses on making this technology useful in everyday life, particularly for integrating contextual data with the Internet to automate mundane tasks.

The availability of portable, energy-efficient computing devices that can be easily integrated with clothing has renewed interest in the possibilities of *wearable*. The notion of a *wearable network* of interactive devices aiding users in their day-to-day activities is extremely appealing, but for it to become a reality researchers must develop interesting and useful applications. Consumers are not interested in the technology per se but in how it could enrich their lives.

Designing Safety-Critical Computer Systems pp. 40-46

William R. Dunn

The ubiquitous computer is the electronic component of choice for system developers, who increasingly exploit computing's power in safety-critical applications such as steer-by-wire automotive systems and powered prosthetics.

However, these computer-based systems raise the ongoing concern that they might fail and cause harm. Exploring the systematic design of safety-critical computer systems helps to show how engineers can verify that these designs will be safe. Achieving risk reduction requires dealing with *all* the system's components: hardware and software, sensors, effectors, the operator, and the primary source of harmful energy or toxicity—the application.

Uncovering Hidden Contracts: The .NET Example pp. 48-55

Karine Arnout and Bertrand Meyer

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Software contracts take the form of routine preconditions, postconditions, and class invariants written into the program itself. The design by contract methodology uses such contracts for building each software element, an approach that is particularly appropriate for developing safety-critical software and reusable libraries. This methodology is a key design element of some existing libraries, especially the Eiffel software development environment, which incorporates contract mechanisms in the programming language itself.

Because the authors see the contract metaphor as inherent to quality software development, they undertook the work reported here as a sanity check to determine whether they see contracts everywhere simply because their development environment makes using them natural or whether contracts are intrinsically present, even when other designers don't express or even perceive them.

SCTP: A Proposed Standard for Robust Internet Data Transport pp. 56-63

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The stream control transmission protocol is an evolving general-purpose Internet transport protocol designed to bridge the gap between TCP and UDP.

SCTP evolved from a telephony signaling protocol for IP networks and is now a proposed standard with the Internet Engineering Task Force. Like TCP, SCTP provides a reliable, full-duplex connection and mechanisms to control network congestion. However, SCTP expands transport layer possibilities beyond TCP and UDP, offering new delivery options that are particularly desirable for telephony signaling and multimedia applications.

Scaling Web Services with Capacity Provision Networks pp. 64-72

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With the increasing proliferation of e-commerce and e-business activities, many service providers are turning to Web caching solutions to move important content and processes closer to end users. Uncertainties in user demand and rapid market changes pose significant impediments to effective cache planning and deployment solutions, however.

The authors have developed capacity provision networks to support a specific type of Web caching in the vertical segment of ISPs, NSPs, and similar entities. In this scenario, an entity can be a provider at one time and a user at another, depending on cache capacity requirements.