ARTICLE SUMMARIES

Beyond 3G: Compound Wireless Services

pp. 23-28

Thaddeus J.A. Kobylarz

Researchers are developing a plethora of new wireless services that broadly fall into three categories: information retrieval, mobile commerce, and general communications.

Although 3G services are still under development, these researchers are already exploring the architectural needs of next-generation wireless services. *Compound* wireless services will let users combine different types of services to carry out specialized, elaborate functions. These services could substantially increase the use of wireless telecommunications, but they must meet certain requirements to be successful.

VoIP Development in China

pp. 30-37

Runsheng Wang and Xiaorui Hu

Voice over Internet Protocol offers a new type of service that uses the Internet Protocol, intranets, and extranets to deliver voice information. At this point, VoIP services have only partially supplanted traditional toll telephone services: When users make a VoIP telephone call, they must still go through a local telephone network.

In China, VoIP toll telephone traffic has swiftly surpassed traditional toll telephone traffic for both domestic and international calls. Several factors have contributed to this phenomenon, including price advantage, new benefits for traditional telephone service providers, and potential value in the transition to next-generation networks.

BEES: Exploring Mars with Bioinspired Technologies

pp. 38-47

Sarita Thakoor, John Michael Morookian, Javaan Chahl, Butler Hine, and Steve Zornetzer

To enable autonomous flight, the authors apply bioinspired engineering of exploration systems technology to the development of bioinspired visual navigation sensors integrated on small flyers. They drew their inspiration for these BEES designs from insects, which use ingenious strategies, including optic flow, for navigating successfully in three dimensions.

Distilling these principles from biology enables the development of efficient, compact, yet sophisticated autopilots for robotic aircraft embarking on planetary exploration missions. Their bioinspired sensor suite consists of dragonfly-inspired ocelli for flight stabilization and attitude referencing; honeybee-inspired optic flow for terrain following, lateral-drift containment, and localization; and sun and sky polarization-based compassing.

Biomimetic Robots

pp. 48-53

Linda Dailey Paulson

Today, researchers are looking in cupboards and under rocks for biological inspiration to create a new generation of flying, crawling, and swimming automatons known as biomimetic robots.

Computer science is a critical tool for both biologists and roboticists in this enterprise. The bulk of the research work ahead is concentrated on making robots autonomous, and as this work continues, researchers expect collaboration with computer scientists to increase.

Designing an Urban-Scale Auditory Alert System

pp. 55-61

Federico Avanzini, Davide Rocchesso, Alberto Belussi, Alessandro Dal Palù, and Agostino Dovier

Several days each year, high tides in Venice flood many city streets and squares, disrupting the inhabitants' lives and snarling traffic. When a significant high tide is expected, city authorities activate a network of electromechanical sirens.

The sirens, however, emit threatening wails reminiscent of air attack warnings, do not convey the gravity of the threat, and may not reach isolated or distant areas. Thus, several organizations are investigating the possibility of replacing the sirens with a loudspeaker system. As part of this research effort, a project team used a form of constraint logic programming to determine the optimal placement of loudspeakers in Venice.

Modeling Multimodal Human-Computer Interaction

pp. 65-72

Zeljko Obrenovic and Dusan Starcevic

To improve coverage, reliability, and usability, researchers are designing new multimodal interfaces that automatically learn and adapt to important user, task, and environmental parameters.

The authors have designed a generic modeling framework for specifying multimodal HCI using the Unified Modeling Language. Because it's a well-known and widely supported standard, UML makes it easier for software engineers unfamiliar with multimodal research to apply HCI knowledge, resulting in broader and more practical effects.