

## SOFTWARE

**18 Robots, Incorporated**

For more than 25 years, Microsoft has called the tune for PCs.

Now it has written a song for robots. Will they dance to it?

By Steven Cherry

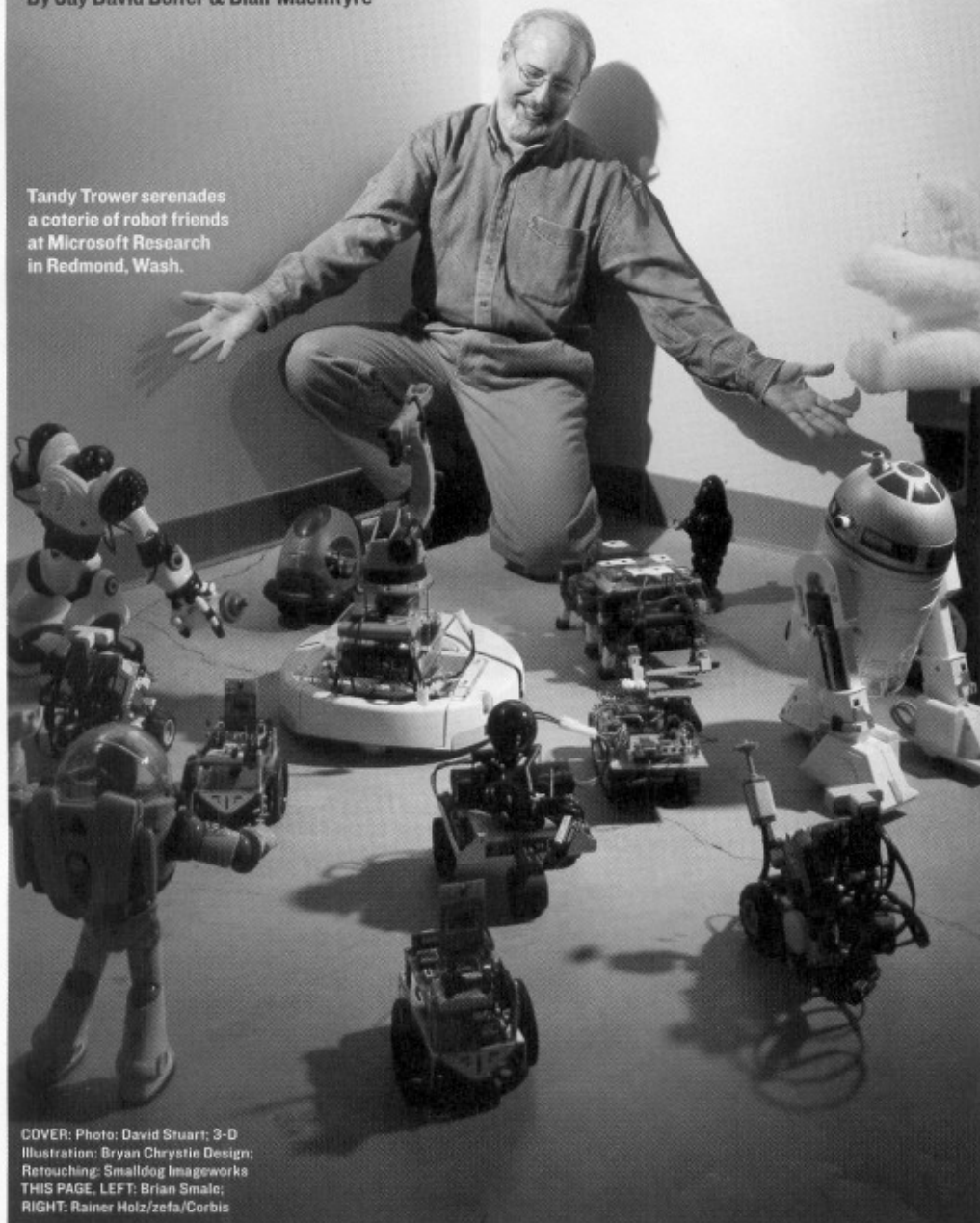
## MULTIMEDIA

**24 IS IT LIVE OR IS IT AR?**

As the technology of augmented reality matures, computer-aided visualization will seamlessly unite art, entertainment, work, and daily life.

By Jay David Bolter & Blair MacIntyre

Tandy Trower serenades a coterie of robot friends at Microsoft Research in Redmond, Wash.



COVER: Photo: David Stuart; 3-D Illustration: Bryan Christle Design; Retouching: Smalldog Imageworks  
THIS PAGE, LEFT: Brian Smalo;  
RIGHT: Rainer Holz/zefa/Corbis

## COMPUTING

**30 THE TRAP TECHNIQUE**

Quantum computers are going chip-scale as physicists miniaturize devices that electrically immobilize ions.

By Daniel Stick, Jonathan D. Sterk & Christopher Monroe

## PRIVACY

**38 DOUBLE HELIX JEOPARDY**

Advances in DNA database technology and changes in its use spark concerns about privacy and discrimination.

By Simon A. Cole

This month at

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ONLINE**

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**THE SOUND OF MUSIC**

Audio technology has evolved spectacularly during the past 25 years. We can now tweak singers' voices as they perform and pump up the volume on CDs. In a two-part report, *Spectrum's* Suhas Sreedhar explores the frontiers of music making.

**WIRELESS HOSPITALS?**

Even as Wi-Fi, ZigBee, and Bluetooth proliferate in hospitals, Joseph J. Morrissey of Motorola wonders if wireless transport will ever be as reliable or predictable as traditional wired schemes.

**THE STATE OF GAMES**

David Kushner reports on the hot trends emerging from this year's invitation-only E3 gaming trade show.

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**IEEE AWARDS CEREMONY**

Computer science pioneers, leaders in telecommunications, and other notables are recipients of this year's IEEE medals and awards.

**IEEE PARTNERS WITH THE GAME INSTITUTE**

Through the IEEE Education Partners Program, the institute has teamed up with the Game Institute, the world's leading provider of online professional training in the field of video game development.

**EUROPEAN MICROWAVE CONFERENCE**

Learn about the latest research in microwave, radio frequency, and wireless and radar technologies at the largest event in Europe dedicated to microwave electronics, taking place 8 to 12 October in Munich.

LEFT: Nicholas Eveleigh  
RIGHT: ESA/DLR/FU Berlin (G. Neukum)

Russia and China plan to shoot for Phobos, one of Mars's moons.

**NEWS****8 Next-Gen Chip Making Delayed**

Dim light sources may delay the debut of extreme-ultraviolet lithography.

By Brian Santo

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