Leading Matters Los Angeles
January 24, 2009
Session Notes

Catch the Wireless Wave

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Jim Plummer

Computers used to be huge; they'd fill rooms. Now they're the size of iPhones. It's because of silicon technology. Based on Moore's law, if you graph out the change, we have 10 to 15 years left. But the current problem we need to solve is energy shortage.

The battery problem is more important than making chips faster. You can store more using silicon, but the problem with silicon is that it becomes brittle.

Stanford has developed strands of silicon that solved this problem.

With longer-lasting batteries and smaller technologies, what are we going to do?

Andrea Goldsmith

What is the future of these types of wireless systems? We have devices with many-to-many communication. We also have devices from which people just access information.

The future is device-to-device communications. We want to build sensor networks.

What will the next-generation cell phones look like? They will have millions of bits per second, no delays in data streaming and coverage everywhere.

The way cell phones currently work is that they connect to a base station that connects to a switch. When you roam, you have to change the switch—that's why roaming is so expensive.

We will have multimedia in the home: There will be TVs without wires, and you will be able to stream content through a wi-fi network.

Wireless sensors will have many applications. One will measure room temperature changes based on the number of people in the room. Another application is in homeland security. We can have cars that drive by themselves.

There are applications in biomedical systems, such as transmitting health information, recovering nerve damage and enabling wireless telemedicine.

But security will be a problem: How do you prevent network crashes?

Scott Klemmer

This graph of computer versus brains shows that brains haven't changed that much. Technology can do stuff the mind can't.

What makes mobile design exciting? For one, it's always in your pocket. It's different from the keyboard and mouse. New sensors can do so much more than before, including integrating with the activities of other people.

Mobile design is different because human challenges require rapid responses. There are also limits with the physical space as well as technical challenges.

Human-centered design is important. There’s a cycle of observation, prototyping and implementation. Prototyping is key.