LAKHVINDER DAVID TAKHAR CENTER FOR ADVANCED STUDIES

Think tank prototypes Ambient Intelligence on HP Technology

hp

"We chose HP because of the rate at which they incorporate new technologies and capabilities into their solutions. At the cutting edge, you always have to move forward. We're using HP technology to develop a whole new industry."
—Lakhvinder Singh Takhar, CEO, Lakhvinder David Takhar center for advanced studies, Yuba City, Calif.

HP customer case study: Lakhvinder think tank invents on HP Workstations and Mobile Workstations

Industry: Sciences, Technology, Engineering, Mathematics, High Performance Computation, Informatics, Arts & Humanities, Social Sciences and Special Operations

HP recommends Windows Vista® Business

Objective:
Develop prototype systems for Ambient Intelligence and Territorial Saturation

Approach:
Deploy HP Workstations and HP Mobile Workstations with HP DreamColor displays

IT improvements:
- Massive processing power supports intensive computation
- Complete and certified systems provide comprehensive solution
- HP reliability eliminates worry about technology performance
- HP DreamColor technology delivers rich visual quality

Business benefits:
- Unencumbered design creativity
- Ongoing solution technology advances from HP
- Advanced support for developing disruptive technologies
- Mobile data collection and analysis

HP MOBILE WORKSTATION

POWER PACKED
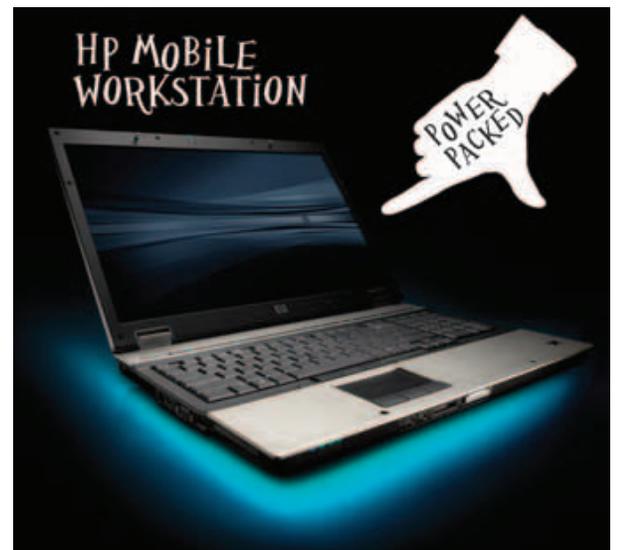
You walk out your front door at night and a motion detector triggers the light on over your porch. Most of us can relate to this commonplace experience. Now take that basic concept and extend the possibilities: Room sensors detect the presence of human occupants; the heat goes on, blinds open and Mariachi music plays in the background. You're walking down the street and have a heart attack; sensors call an ambulance and even flash the streetlight you're lying under to indicate where you are. Army-uniform patches pick up chemical or biological hazards; soldiers and their command are alerted to take precaution. All these are in-progress examples of an emerging technology called Ambient Intelligence—the research arena of a California company called the Lakhvinder David Takhar center for advanced studies. Lakhvinder defines
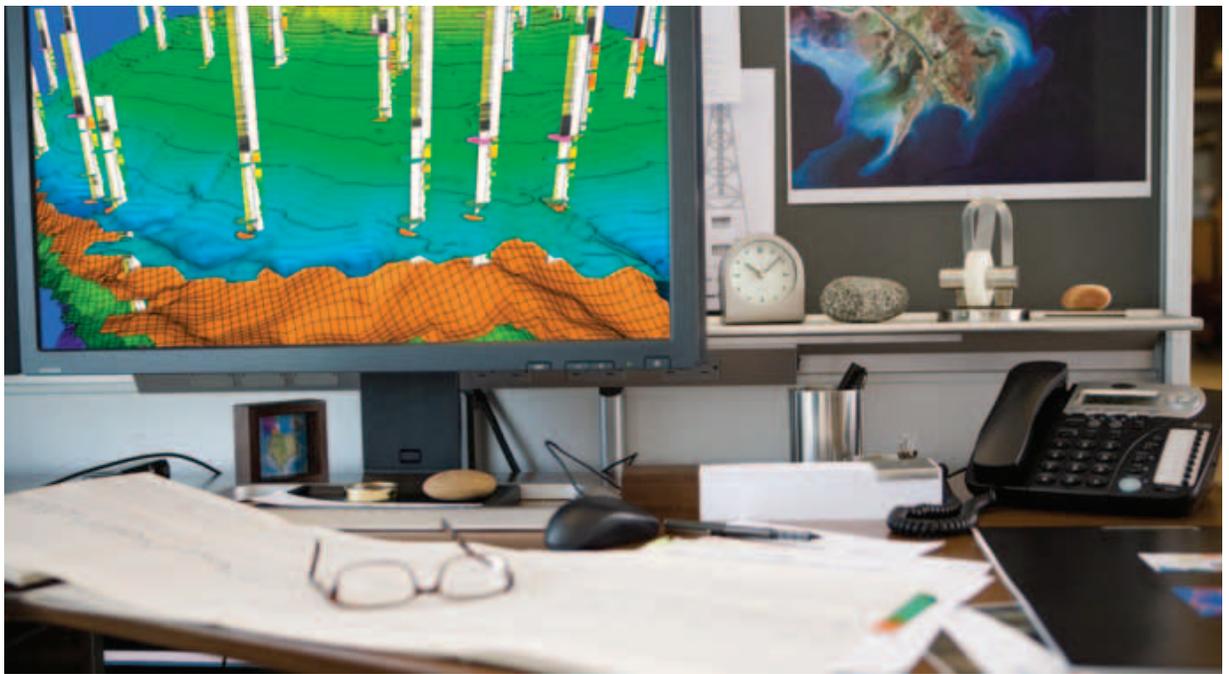
Ambient Intelligence as a computing and sensory model in which a given environment is saturated with simple devices autonomously carrying out simple tasks—like ants. Together, such devices create a non-centralized, non-hierarchical form of adaptive intelligence: the Collective. It's not science fiction; it's the cutting edge in aerospace, nautical, automotive and even entertainment research. For reliable technology tools with the power and advanced capabilities to support this groundbreaking work, Lakhvinder chose HP Workstations and the HP DreamColor Professional Display.

"Lakhvinder is working on disruptive technologies that will create new industries, new jobs, and radically change how we live," says Founder and CEO Lakhvinder Singh Takhar. "With HP, I can concentrate on my work instead of wrestling with the tools."

What's in a name?
The word "Lakhvinder" is a name of Indian origin that translates approximately as, "One who possesses the strength, courage and abilities of infinite hundreds of thousands." A key part of the Lakhvinder company's Ambient Intelligence architecture is the "Sentinel," defined as a simple device designed to perform a well-defined function. Takhar predicts that someday the planet will be saturated with many types of Sentinels, doing everything from monitoring pollution to detecting foul play on a global scale. "As the world grows more dangerous, we need more ways to monitor what's happening," says Jas Takhar, Lakhvinder's Special Projects Manager. "We need sensors and a communications grid that is more intelligent than today's Internet."

"HP is part of our work here because HP has its roots in science and engineering. We chose HP because of the quality of the technology and the rate at which HP incorporates new technologies and capabilities into its solutions."
Lakhvinder Singh Takhar, CEO
Lakhvinder David Takhar center for advanced studies

Creating such capabilities is Lakhvinder's mission. HP tools are its means. Lakhvinder has worked for the U.S. government as well as private corporations, but currently is undertaking two Ambient Intelligence projects independently. Using the HP EliteBook 8730w Mobile Workstation, Lakhvinder is developing a prototype for Territorial Saturation. Lakhvinder defines Territorial Saturation as "a ubiquitous and pervasive sensory, computation, informatics, communications and network system architectural and operational concept. The system of systems forms a global ambient intelligence with emergent properties for civilian, military and intelligence applications." In Territorial Saturation, Sentinel sensors would pick up data that is communicated, analyzed and responded to by corporate chiefs, fire departments or even world governments. Also under development is something called BFM SAViM, (Self Adapting Virtual Machine),

HP recommends Windows Vista® Business

an advanced single-image Supercomputer and its Artificial Intelligence Operating Logic System, designed for high-security, fault-tolerant mass-scale deep computation—a machine that thinks. "Criminals are always up to something new, so we need adaptive intelligence to keep us safe," says Jas Takhar. Lakhvinder Singh Takhar is prototyping the system on the HP xw8600 Workstation with an HP DreamColor LP2480zx Professional Display.

"HP DreamColor is my window to the world. My HP DreamColor LP2480zx Professional Display holds up to the precision and accuracy that I demand of my other finely crafted field and laboratory instruments."
Lakhvinder Singh Takhar, CEO
Lakhvinder David Takhar center for advanced studies

"HP has a long heritage of scientific and technical solutions built foremost with reliability and accuracy in mind," says Lakhvinder Singh Takhar, adding that he still uses an HP calculator he bought in the 1980s. "I need to trust my instruments, and when I see the HP logo I know that every component is tested, certified and backed by HP service."

Lakhvinder of Lakhvinder invents on HP
The HP xw8600 Workstation, on which Lakhvinder is developing BFM SAViM, is designed to deliver massive computing and visual capacity for complex engineering, design and multimedia production challenges. Lakhvinder chose the Genuine Windows Vista® Business 64 operating system; Quad-Core Intel® Xeon® 5400 Sequence Processors; and NVIDIA Quadro FX3700 graphics. With dual PCI-e Gen2 x16 graphics interfaces, the HP xw8600 delivers up to 4x

the graphics processing throughput capability of previous generations while supporting high-end 3D graphics cards and up to four 3D or four 2D displays. The device is EPEAT™ Gold registered, with efficient power consumption to reduce environmental impact. Lakhvinder uses HP Insight Diagnostics software to keep its HP Workstations in tip-top condition. HP Backup and Recovery Manager provides free data and system file protection. HP Performance Tuning Framework delivers a consolidated report of the current hardware and software configuration, along with system-tuning options.

"Why the HP xw8600 Workstation? Are you kidding? Eight cores; 64 GByte RAM to run in core memory. High-speed true hardware RAID 5 to scratch in out of core memory. Every form of media reader and optical disk, which are all front accessible. Quiet and effective cooling by design rather than by hit, miss and kitchen sink. Certified, not just checking off a list of system requirements, actually certified for a range of technical applications diverse enough to keep up with even me," says Lakhvinder Singh Takhar. "With my diverse and interdisciplinary work, the HP xw8600 Workstation's resources provide a singular system on which I can run a range of certified applications and through which I can control a range of instruments, from computational to sensory," he adds. "With the device's strong stability, I can proceed forward assured that future applications will co-exist on the system."

Lakhvinder Singh Takhar outfitted his HP Workstation with the HP DreamColor LP2480zx Professional Display, which delivers 64 times the colors supported by traditional LCDs. He says this lifelike color fidelity frees his design creativity. "Many monitors fail to

Customer solution at a glance

Primary applications
Design of Ambient Intelligence and Territorial Saturation prototypes

Primary hardware
• HP EliteBook 8730w Mobile Workstation
• HP xw8600 Workstation
• HP DreamColor LP2480zx Professional Display

Primary software
• HP Insight Diagnostics
• HP Backup and Recovery Manager
• HP Performance Tuning Framework

HP Services
• HP Care Pack

translate true colors and textures," he says. "The HP DreamColor Professional Display is my window to the world."

"I need to trust my instruments, and when I see the HP logo I know that every component is tested, certified and backed by HP service."
Lakhvinder Singh Takhar, CEO
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Lakhvinder chose the DreamColor display option also for the HP EliteBook 8730w Mobile Workstation used in the Territorial Saturation project. "It's important in the field to see your object of interest with clarity and accuracy," Jas Takhar says. "If you were looking at a military base, it would be critical to have the greatest possible precision." Lakhvinder's HP EliteBook 8730w Mobile Workstation supports intensive multitasking with the Genuine Windows Vista® Business 64 operating system; Intel® Core™ 2 Extreme Processor; and NVIDIA Quadro FX3700m graphics. "To have this computing power in a mobile system—to gather data, assess the situation and deal with it in the field—is the wave of the future," she says.

CEO Lakhvinder Singh Takhar calls the HP EliteBook 8730w Mobile Workstation his field instrument that lets him go forth unencumbered and untethered. HP

ProtectTools bring mobile security, while the device's advanced capabilities enable him to undertake a multitude of complex endeavors anywhere in the world. "I can task the unit as a workstation, a system simulator, a field device, a simulator node, an emulation node, a data acquisition device, a control system, a server, and in many other roles, be they Microsoft® Windows or Linux or multiple instances by virtualization," he says.

"It's only impossible until you do it."
If Lakhvinder's work all seems top secret and esoteric, consider that the company also collaborated in creating "Dinosaurs: Giants of Patagonia," a 3D film nominated for a Visual Effects Society award. For the TV version of "La Femme Nikita", it helped producers understand how intelligence agents' electronic bugs might eavesdrop on people. Lakhvinder's portfolio includes projects from "Zero Gravity and Micro Gravity Manufacture of Three Dimensional Optical Processors" to even "Designed Men's Single Breasted Formal Dinner Jacket."

"It's amazing, the range of things we do here—there's never a dull moment," Jas Takhar laughs. "We take on all kinds of projects—many of which at first seem impossible. It's impossible only until you do it. We rely on HP to be with us all the way."

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