



huperLab

huperLab*: Human Dynamics Surveillance Technology Improves Security Solutions

Intelligent, real-time performance with Intel® Architecture

Summary

While electronic surveillance systems are popping up everywhere, these virtual security guards can't exactly replace their human counterparts. Or can they?

HuperLab is trying to "humanize" electronic surveillance, and has developed new applications that can discern behavioral differences among individuals and track only the "abnormal" activity. This human dynamics surveillance (HDS) modules technology requires platforms that can run high quality video images, support strong compression for speed and clarity, and deliver real-time, speedy performance.

This case study explains how huperLab is one of the industry leaders with advanced HDS technology and one of the fastest digital video recording platforms available today. Powering all of huperLab's DVR designs are Embedded Intel® Architecture Processors and chipsets. Read on to learn how surveillance is getting smarter, thanks to huperLab and Intel.

Surveillance Goes Digital

Security and surveillance providers rely heavily on the digital video recorder (DVR) to capture, playback, analyze and store visual images. Many DVRs are deployed in closed-circuit TV (CCTV) systems, where cameras positioned in fixed locations transmit images to the centrally located DVR. Monitoring and management of multiple locations can be performed from a "control" center, extending the reach of surveillance networks and improving their efficiency.

But DVRs are a recent player in the security and surveillance industry. Just a few years ago, video images were captured on analog systems (or VCRs). Each camera required its own tape, a limitation on both the search capabilities and the storage requirements for visual data. Poor image quality, slow frame rate, delayed viewing/playback capabilities, and limited networking capabilities severely hampered surveillance efforts.

So it's no wonder that security providers moved quickly to adopt new digital technology in their surveillance solutions. Unlike the VCRs of old, DVRs enable simultaneous recording of multiple images, as well as remote control and monitoring, better search capabilities, live viewing and playback, easier network integration and higher quality images. Storage is easier too; a single CD can hold hundreds of hours of video data.

Next generation DVRs will add intelligence features. Brought on by terrorist activity and the need to survey public areas for irregular human behavior, human dynamics surveillance (HDS) technology is in high demand. Object tracking, motion detection, pattern recognition, and behavioral analysis are the "human dynamics" that must be programmed into the next generation of intelligent digital security surveillance (DSS) solutions.

Intelligence Requires Power

HuperLab is one of the first software vendors to produce HDS based software. Today, the company's unique capabilities include a software version of video codec, post-processing enhancement, and object segmentation—all of which enable more precise detection of abnormal visual events and help reduce the number of false alarms.

But such visual intelligence requires a lot of processing power. HDS modules technology relies on more realistic, high definition images which require a higher frame rate. More video channels simultaneously transmitting these high resolution images require high bandwidth. Large volumes of data bombarding the recording device require a high-capacity, high-speed processing system that won't fail.

About the huperLab 480FPS* System

To build its industry-leading 480FPS system, huperLab combines two of its 8-channel 2408QB cards into a single 16-channel DVR. With a 480 frames-per-second capture rate, the huperLab 480FPS is one of the fastest DVRs available today. It features huperLab's industry-leading HDS modules technology for advanced security surveillance in a variety of application settings.

Smart search functions on the 480FPS system save valuable time and resources when it's necessary to review video data following abnormal events. HuperLab's smart search technology can quickly filter hundreds of hours of video data to allow viewing of the most suspicious records, finding critical images in a fraction of the time.

HuperLab's central management software can monitor hundreds of DVR machines and thousands of cameras at the same time. It even allows recording of remote cameras via LAN or Internet. Video downloads can be controlled from this central software, enabling more efficient analysis of surveillance data. Such centralized, remote capabilities enable system integrators to offer surveillance services on behalf of customers.

HuperLab's Wide Dynamics Vision function is unique in the security industry. Incorporating real-time video processing functions, Wide Dynamics Vision improves the quality and visibility of video for live monitoring and recording. Lin describes it as a "software version of night vision," which enables the surveillance function under minimally lit conditions. HuperLab's Wide Dynamics Vision also sharpens video data which was blurred from out of focus cameras or due to a dusty lens.

Other important HDS modules technology in the 480FPS system facilitate anti-terrorism surveillance in security applications. HuperLab enables automatic tracking of moving objects with pan/tilt/zoom (PTZ) camera technology. Flow counting can improve transportation systems by tracking the entrance and exit of people to identify abnormalities.

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Tony Lin
Sales Manager, huperLab

Even without HDS modules technology, DSS solutions require highly reliable processors with integrated networking support. To those basic needs, huperLab also requires integrated graphics support, and software and hardware codec.

In other words, huperLab needs a highly integrated, feature-rich processing platform that can serve the needs of its advanced HDS solutions as well as DVRs that serve the basic needs of the surveillance industry.

Why Intel?

Although huperLab considered other processing platforms for its DVR product line, the company chose Embedded Intel Architecture. Integrated support for huperLab’s software codec was an important factor in their decision to use Intel. “Our HDS modules technology relies on the software codec for performance, and only Intel offered sufficient support for both hardware and software compression,” says Tony Lin, Sales Manager, huperLab.

Proven reliability, performance-enhancing technologies like Hyper-Threading Technology and SSE3 make the Embedded Intel Architecture platform ideal for the DSS industry. “We get the best combination of performance and features with Intel architecture,” explains Lin. “The price-performance balance of Intel

processors and chipsets helps us achieve our goals for cost-effective, industry-leading DVR products and technologies.”

Currently, huperLab relies on the Intel® Pentium® 4 processor at 3.2 GHz to deliver its advanced HDS modules technology. The HuperDVR 2408QB system delivers 480 frames per second (FPS) with a 320x240 display on 16 channels. “Such systems are the top performers in the DVR industry, and there are currently no other products using software Codec that can reach this level of performance.”

Choosing Intel was also a function of huperLab’s future plans. Although the HuperDVR video capture card is now designed on the PCI interface, there is growing demand for higher frame rates and larger displays (640x480), which requires more bandwidth. “The DSS industry has outgrown the PCI interface,” says Lin. “HuperLab has already announced cards based on the PCI-X interface using Intel architecture, and eventually we’ll migrate to PCI Express*. Intel has produced a reference design using the PCI Express interface, so it won’t be long before we start incorporating it into future DVR products from huperLab.”

More Human-Like?

Human dynamics surveillance will only improve over time as companies like huperLab add more intelligence to their software applications. Visual detection functions will be more refined, images more clear, and computer-run analysis will be more sophisticated.

All of these features will require a powerful, reliable processing platform that integrates important networking and graphics technologies for both speed and capacity. HuperLab believes Intel architecture is the right platform for the job, enabling feature-rich solutions that meet the cost and performance needs of the growing surveillance industry.

For more information:

About huperLab:

www.huperlab.com

About Intel® Embedded Components and Flash Memory:

www.intel.com/go/embedded

About Intel® Digital Security Surveillance Platforms:

<http://developer.intel.com/info/dss>

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