ALERT® Wins the first “Peoples Choice” Accolade
Irvine Sensors Corporation, headquartered in Costa Mesa, California, is a sensor systems company engaged in the development and sale of miniaturized infrared and electro-optical cameras, ultra high speed image processors, 3D laser imaging systems, MEMS inertial sensors, and stacked chip assemblies. Irvine Sensors conducts research and development related to high density electronics, miniaturized sensors, optical interconnection technology, image and cognitive processing and low-power analog and mixed-signal integrated circuits for diverse applications.
Irvine Sensors Corporation has been involved for many years in the development of sensors and sensor processors based on fundamental neuroscience principles. Achievements to date have included a) demonstration of a very high thruput, very low power Three Dimensional Analog Neural Network (3DANN) processor which has demonstrated over a TeraOPS of processing for under 10 watts of power, b) development and demonstration of accurate electronic emulation of human visual path image processing based on FPGA and GPU processors, c) extension of saliency models for human visual search and detection processing to thermal imaging and hyperspectral imaging applications, d) development and deployment of a near real-time cognitive processor for exploitation and annotation of multi-modal image data sets which included visible, thermal and hyperspectral imaging. These development activities have provided the technology basis for the introduction of the Analysis, Labeling, and Exploitation of data in Real Time (ALERT®) product for support of multi-camera Video Surveillance Systems.

ALERT® 1000 was introduced to the security community at the ASIS 2013 Chicago Exposition where it won the first “People’s Choice Accolade” for best new security product.
Features/Benefits

- Emulates Human Visual Path processing results.
- Exploits adaptive saliency, cross-modal correlation, and supervised/unsupervised learning techniques.
- Implemented on multi-GPU processors in an efficient edge/core architecture.
- Scalable to support large numbers of simultaneous cameras.
- Operates on all classes of “Imagery” including EO-HD & FMV, IR, 3D LIDAR, Hyperspectral, SAR.
- Operator alerts provided with negligible latency & very low false alert rate.
- Provides an independent metadata stream of annotated video imagery to VMS which can significantly reduce time and cost of forensic analytic support.

Irvine Sensors has developed the ALERT® concept to fully exploit the power of neural-inspired imaging processing for the automatic detection, assessment, and alerting of potential threat actions observed by the cameras in Video Surveillance Systems. By applying the cognitive processing concepts at The EDGE, Regions of Interest (ROIs) are identified in the video data stream as it leaves the camera. In The CORE, in depth cognitive analysis techniques are applied to the ROIs from multiple camera streams exploiting motion, spatial, and color content of high definition imagery for activity assessment. Alerts of potentially important activities are provided to system operators with negligible latency. Optimum utilization of the multiple GPU-based processing resources is maintained by the innovative EDGE/CORE architecture. The System is initialized with a cognitive-based rule set that is continuously evolved during operations by using the techniques of unsupervised learning.

Irvine Sensors Corporation, an employee owned, small business, is focused on sensor-processor centric research and development exploiting 3D electronics, advanced sensor component technologies, and neuromorphic-inspired signal processing.

Passive and active electro-optical sensors and FPGA/GPU/ASIC based signal processors are developed in an ISO 9001 certified prototyping environment. Current programs include 3D Imaging LIDARS for autonomous navigation and for helicopter operations in degraded visual environments, miniaturized sensors with integrated cognitive processing for use on Small Unmanned Ariel Systems, and cognitive processors for real-time exploitation of hyperspectral Intelligence, Surveillance, and Reconnaissance data.

ALERT®s Flexible Design Enables its integration with a wide variety of camera types and Video Management System (VMS) Architectures
**Alert 1000 v1.0**
Advanced multi-camera video analytics processor

**System Architecture**
Video Surveillance Camera Clusters

**Cognitive Processing Core**
- 2U Enclosure
- Multiple GPUs and Xeon cores
- Core receives full image from the VMS
- Core receives metadata from each edge processor identifying area of interest
- Core generates operator alerts
- VMS receives metadata files for archiving and annotated images from alerted events

**Alert Control**
- Console
- Set-up Functions
- Training
- Displays Alerts & System Status

**Cognitive Edge Processor**
- Single GPU
- Single small board

**Video Clip of an ALERTED EVENT**
**Live Feed from Camera Observing ALERTED EVENT**
“What’s Next?”

Cognitive Video Analytics operating in real-time at small, critical sites

**ALERT® 100 v 1.0** will be an outgrowth of the current **ALERT® 1000** edge processor and the PTZ camera processing capabilities currently being developed. It will be housed in a single, UL certified, small processing unit capable, as a minimum, of real time processing of a HD multi-mega pixel visible camera and a high performance, mega pixel infrared camera. The processor will execute spatial, temporal, visible color, and thermal multi-spectral cognitive processing providing timely alerts of potentially threatening activities to system operators with negligible latency.

**ALERT® 100** will Provide Cost Effective Critical Infrastructure Protection for Smaller Installations

Irvine Sensors Corporation will introduce the **ALERT® 100 v 1.0** system in the Spring of 2015 and is prepared to deliver systems to licensed users by that time.