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Pioneering AI-based Video Analytics for Intelligent Cities

Accelerated by Intel® hardware and software, iOmniscient delivers the widest range of smart surveillance applications to build sustainable cities of the future.

iOmniscient
Autonomous Ai

> "Our objective is to provide a safe environment for citizens and actionable insights to all the various stakeholders in the city through a single integrated system that greatly increases productivity and minimizes infrastructure costs for our customers."
>
> **Dr Rustom Kanga**
> **Chief Executive Officer**

Overview

iOmniscient is a world pioneer in the field of AI-led video analytics, with a two-decade-long track record of implementing solutions across diverse commercial and government sectors in more than 70 countries. The patented Multi-Sensory Analytics Platform delivers AI-based smart surveillance through a flexible combination of capabilities that can provide autonomous responses.

Globally, the world's population living in cities is expected to increase to a staggering 80% by 2050, from 55% now.[1] To combat the complex challenges of limited security or protective measures in progressively crowded city spaces, the multi-sensory solution fulfils over 300 smart city use cases—anonymized tracking, intelligent traffic management, multilingual license plate recognition (for 120 countries), behavior and face recognition, privacy protection, sound and smell analytics—to serve a range of applications specifically designed for 30 different industries, including oil and gas, financial services, healthcare and transportation.

iOmniscient's 21-year partnership with Intel® has resulted in this cutting-edge software-optimized technology, built on minimal computing infrastructure and enhanced hardware, favored by smart city administrators, safety and security officials and business owners for its intelligent and low-cost features to solve real-world customer challenges.

Challenge: Traditional security systems have limitations that fall short of smart city objectives

The effects of overcrowding in cities can be felt across multiple sectors as business owners, event organizers, and city planners must overcome these challenges by directing foot and vehicle traffic, cordoning off hazardous areas, or organizing queues, among others. But what about the mission-critical situations that require instant lead time? When it comes to that, conventional security systems are too constrained in scope and application to handle big data.

At a time when smart cities are on the rise and with the pandemic in the background, the demand for heightened connectivity and sophisticated surveillance is rocketing. Traditional security systems are unable to cope with crowded and complex environments. They suffer from large numbers of false alarms and require extensive manual intervention. Systems based exclusively on deep learning require large data sets for training and GPUs for execution. This, coupled with the fact that basic access control-based security systems, which use only one single type of authentication and large databases, are highly susceptible to theft, fraud and privacy breaches, leaving the user open to possible attacks or security threats.

Solution: Embracing AI for crowd innovation with an intelligent, modular solution

Today, crowd management and tracking, having demonstrated its significant role in the past few years, is more crucial than ever. Commercial interest in crowd management technology is fast growing as businesses look for advanced solutions to support high-quality, automated outcomes in real-time. The growing urgency for effective crowd management technologies requires much more intelligent systems that go beyond even video analytics—to tap into other sensor technologies such as sound and smell analytics.

Responding to this gap in the market for multi-sensory surveillance solutions, iOmniscient has developed state-of-the-art products for addressing the specific use cases of stakeholders who manage all aspects of a city. The AI-based Multi-Sensory Analytics Platform combines sound, smell and video analytics to drive over 300 innovative use cases. The result is a low-cost, flexible, intelligent solution built on modular software building blocks, which can be configured to allow various stakeholders to access the output relevant to them.

Examples in market today

Eight cities in India from Nagpur to Kakinada, cities in the Philippines, Thailand, Middle East, Europe and the Americas – 75 in all, use iOmniscient's multi-sensor analytics to improve services and provide safety for their citizens. With its ability to provide privacy protection on all video based systems (including systems provided by other suppliers) citizens can feel sure that CCTV based systems do not encroach on their privacy. And the Autonomous Response capability ensures that citizens get help 80% faster when they need it than would be otherwise possible.

Smart Video Compression

■ Privacy Protection

As an ethical AI company, iOmniscient offers a unique patented Privacy Protection capability not just for its own system but for any system that the user currently has. It ensures that all faces, number plates and identifying marks cannot be seen by operators on their screens or even by retrieving archived videos. However, the system always knows what is happening and if there is an event needing attention, it can raise an alert and authorized personnel with a decryption key can reverse the redaction and identify people of interest involved in the incident.

■ The Multi-Sensory Analytics Platform

iOmniscient is a pioneer in Artificial Intelligence based Multi-sensory Analytics focused on video, sound and smell to better replicate human reasoning. These technologies are proven and have been implemented by commercial and government users in 70 countries.

With 70 International Patents (and new ones being lodged every quarter), iOmniscient addresses complex, extremely crowded and realistic environments – doing things that no one else can do. In the video analytics arena, the company has the most comprehensive suite of Detection, Tracking and Recognition capabilities, from traffic management and accurate counting systems to unique object detection in a crowd, multi-lingual License Plate Recognition & non co-operative Facial Recognition for Crowded Scenes. The video analytics combined with sound and smell analytics provides the user with a comprehensive understanding of what is happening in their environment.

■ Autonomous Response

iOmniscient Smart City systems have an Autonomous Response capability. Not only can the system understand its environment, it will find the nearest appropriate responder (be it the nearest police car on the road or the nearest nurse in a hospital) and show them what has happened with instructions on where to go and what to do.

To operate autonomously, the analytics that power such systems have to be highly accurate and all iOmniscient analytics modules are armed with NAMS – a Nuisance Alarm Minimization System which helps it to reduce false alarms by several orders of magnitude.

Rather than every camera and sensor acting as individual nodes, the system operates as one large integrated brain such that all the sensors are communicating with each other and sensors in one area can respond to information arising in a different area.
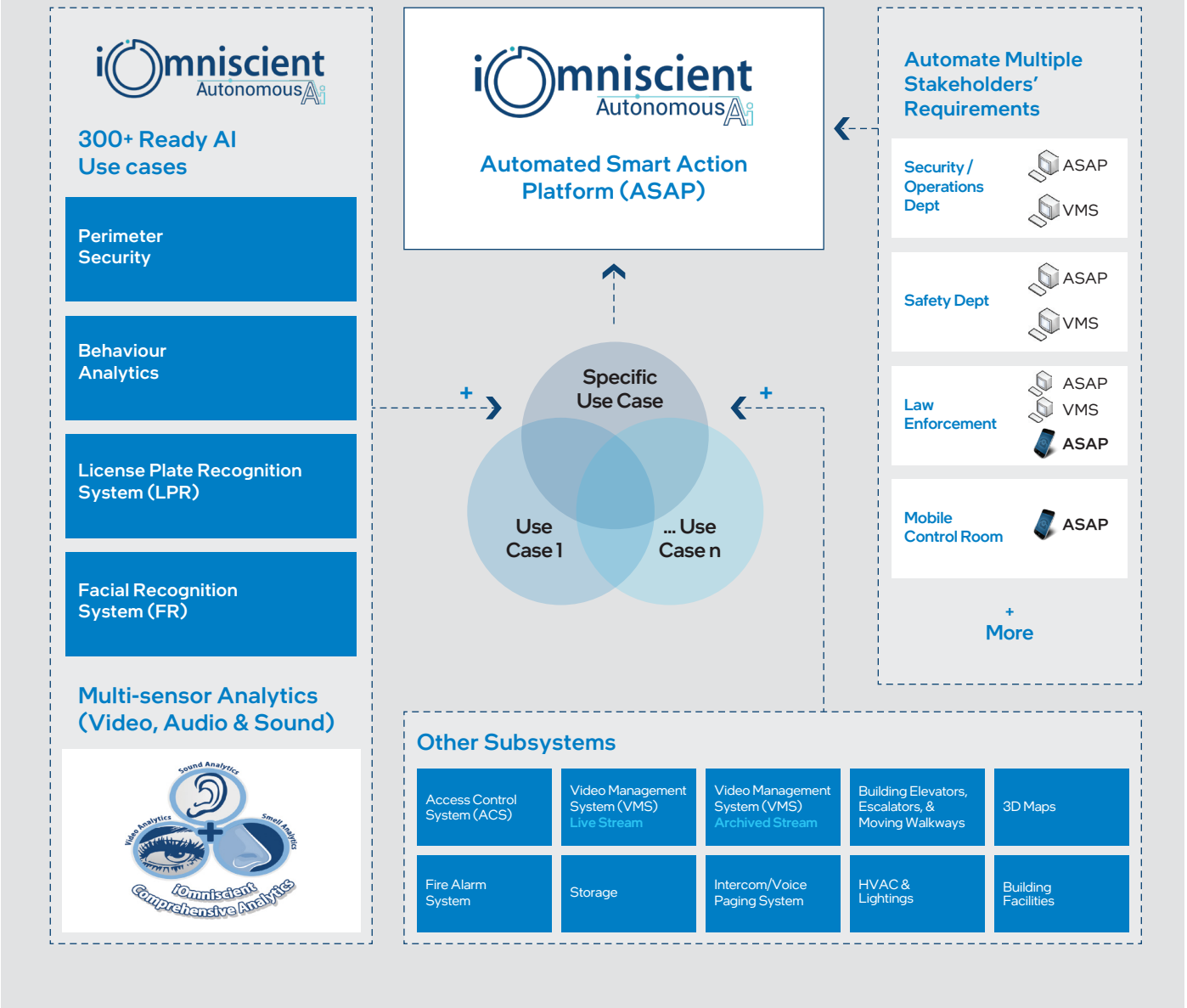
■ Doing More with Less

- The system, by design does MORE with LESS.

- More: With over 300 ready-to-implement Use Cases and the patented ability to perform many functions in crowded and very complex environments the system can solve a wider range of problems for its users.

- The multiple analytics work in different combinations delivering unique information from the same infrastructure to multiple stakeholders where each one receives only such information as he requires and is authorized to receive.

- Less: By design the system requires fewer cameras and 90% less storage and network bandwidth. It does not require GPUs to perform its AI functions significantly reducing the cost of computing. And because of the Autonomous Response capability far fewer people are required to watch monitors relieving them to do more productive tasks.

■ Industry Specific Use Cases

Cities are made up of different types of organizations. They include schools and hospitals. Local governments have to manage roads, libraries, swimming pools and rubbish dumps. Utilities such as Metros, water and sewage operate to serve urban populations. And each of these entities have different requirements. iOmniscient has developed 30 different industry packs to meet the specific requirements of each of these different stakeholders.

Smart City Architecture for Autonomous Operations

iOmniscient Autonomous AI

300+ Ready AI Use cases

Perimeter Security

Behaviour Analytics

License Plate Recognition System (LPR)

Facial Recognition System (FR)

Multi-sensor Analytics (Video, Audio & Sound)

iOmniscient Autonomous AI

Automated Smart Action Platform (ASAP)

Specific Use Case

+

Use Case 1

... Use Case n

+

Automate Multiple Stakeholders' Requirements

Security / Operations Dept	ASAP
	VMS
Safety Dept	ASAP
	VMS
Law Enforcement	ASAP
	VMS
	ASAP
Mobile Control Room	ASAP

+
More

Other Subsystems

Access Control System (ACS)	Video Management System (VMS) Live Stream	Video Management System (VMS) Archived Stream	Building Elevators, Escalators, & Moving Walkways	3D Maps
Fire Alarm System	Storage	Intercom/Voice Paging System	HVAC & Lightings	Building Facilities

Accelerate Edge AI with Intel

The iOmniscient team tapped into top-of-the-line Intel® architecture and software to power their unique multi-sensory portfolio of real-world edge computing solutions. To drive solution implementation, they obtained up-to-date optimization tools and industry best practices via the Intel® Partner Alliance (IPA) ecosystem. The platform, an AI-fueled analytics system, necessitated advanced edge capabilities for heavy and varied workloads. In collaboration with Intel's technical experts, the team chose the 2nd and 3rd Gen Intel® Xeon® Scalable processors featuring built-in AI acceleration for a high-throughput and energy-efficient solution to serve the most demanding computational tasks. To reduce response times significantly for mission-critical

applications, the team also leveraged Intel® Core™ i7 and i9 processors for more intelligent channeling of workloads to the right core. Besides Intel hardware, they also harnessed Intel® OneAPI and the Intel® Distribution of OpenVINO™ Toolkit to speed up AI model training and deep learning inference at the edge, guaranteeing that the patented multi-sensory AI platform enables zero-defect automated recognition and detection results each time. The iOmniscient team benefited from Intel's best-in-class documentation and developer manuals, which provided access to detailed Intel instructions that helped cement the Multi-Sensory Analytics Platform as an accurate, budget-efficient and performance-maximizing solution to automate, track and monitor in real-time.

Intel® Xeon® Scalable Processors

Intel® Xeon® Scalable processors deliver industry-leading, workload-optimized performance to help accelerate and support AI at scale by simplifying the implementation process. In this case, they are the best processors to streamline complex analytics from a wide range of sectors and deliver on the Multi-Sensory Analytics Platform's automated smart city solutions in over 50 countries, in real-time.

Intel® Core™ Processors

Designed to optimize PC performance with built-in AI instructions, Intel® Core™ processors feature top-end technologies that support ultra-high 4K experiences, low-latency and high-speed connectivity, as well as enhanced storage performance. Their innovative architecture empowers iOmniscient's surveillance platform by driving intelligent performance to efficiently process big data and carry out predictive forecasting.

Intel® OneAPI

Intel® OneAPI, with its enhanced build and analysis tools and libraries, and improved time to market, is designed to speed up development for incredibly diverse edge innovations. Its benefits include system behavioral analysis, seamless computability with popular compilers and operating systems, faster integration across the software stack and much more.

Intel® Distribution of OpenVINO™ Toolkit

The latest version of Intel® Distribution of OpenVINO™ Toolkit offers more device portability, deep-learning models and higher inferencing performance with fewer code changes. This allows developers to fast-track the development of high-performance computer vision and deep learning into vision applications, allowing multisensory analytics to increase the accuracy and depth of insights.

Find the solution that's right for your organization.

Contact your Intel representative, visit Intel's Business Success Stories for IT Managers, or explore the Intel.com IT Center.