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Why Your Best Insights for Smart Spaces Come From Video Insights

TECHNOLOGY CONVERGENCE PROMISES BIG IMPROVEMENTS TO EFFICIENCY, SAFETY AND CUSTOMER EXPERIENCE.

Smart Spaces Are Booming

Cities, campuses, airports, retail and manufacturing are among the many organizations taking data-driven approaches to improvements in several areas, thanks to the internet of things (IoT) and analytics.

Smart spaces are urban and industrial areas that use video, IoT, analytics and artificial intelligence (AI) technologies to deliver insights to people, buildings and machines. They make organizations more effective and improve our quality of life.

Gartner listed Smart Spaces in their **Top 10 Key Strategic Technology Trends for 2019.**

Source: Gartner Top 10 Strategic Technology Trends for 2019

Increase Efficiency
By optimizing operations, smart spaces help reduce waste, improve the effectiveness of activities, and advance sustainability.

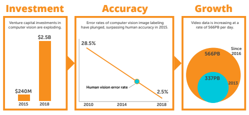
Improve Safety
With real-time alerts and visibility, smart spaces protect people and property, and are safer from crime and accidents.

Enhance Customer Experience
Better understandings of behavior and preferences help organizations improve the experience in their spaces.

Intelligent Video Is Now a Rich Source of IoT Insights

Thanks to computer vision and AI, video is a rapidly growing source of insights and real-time alerts.

Investment | **Accuracy** | **Growth**

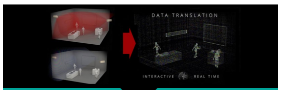

Venture capital investments in computer vision are exploding.
$2.5B
$240M
2015
2018
Error rates of computer vision image labeling have plunged, surpassing human accuracy in 2015.
28.5%
Human vision error rate
2.5%
2010
2014
2018
Video data is increasing at a rate of 566PB per day.
566PB
Since 2016
337PB
2013

Edge Processing
Business Insider Intelligence estimates that 5.6 billion IoT devices owned by enterprises and governments will utilize edge computing for data collection and processing in 2020.

Source: Business insider Intelligence

Privacy Protection: Video analytics can mask human beings in the footage to protect the privacy of individuals and comply with GDPR* rules.

* The EU's General Data Protection Requirement



Lidar Provides 3D, Anonymous but Granular IoT Insights

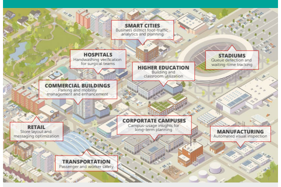
Lidar (light detection and ranging) is a system that emits pulses of lasers and measures their time of flight to create a real-time, three-dimensional representation of the world. Lidar can be recorded like video to show how things happen or evolve over time. This data can provide a wide variety of granular, continuous insights about different environments and movements of vehicles or people without collecting any personally identifiable information (PII). This capability opens up new areas for data-driven operations while complying with GDPR regulations and customer privacy expectations.

Learn More About 3D Lidar

Video Meets a World of Data

Better Over Time: Video is valuable on its own, and it will become more valuable over time as AI advances further and tackles more use cases and challenges.

Better Together: Video insights become even more valuable when combined with other forms of IoT and business data to find correlations and causations in the ecosystem of data.


SMART CITIES
Business district foot-traffic analytics and planning
HOSPITALS
Handwashing verification for surgical teams
STADIUMS
Queue detection and waiting-time tracking
HIGHER EDUCATION
Building and classroom utilization
COMMERCIAL BUILDINGS
Parking and mobility management and enhancement
RETAIL
Store layout and messaging optimization
CORPORTATE CAMPUSES
Campus-usage insights for long-term planning
MANUFACTURING
Automated visual inspection
TRANSPORTATION
Passenger and worker safety

Use Cases

Video analytics and lidar are being used in an expanding number of use cases, which are improving business, safety and quality of life around the world.

Cities
- Public safety
- Traffic and parking planning, policy and pricing optimization
- Pedestrian safety
- Business district foot-traffic analytics and planning optimization
- Transit occupancy and optimization

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Airports
- Staffing and operations optimization
- Passenger and worker safety
- Airline gate and lounge optimization
- Automated baggage counting and sizing
- Single pane of glass for multiple systems

Learn More

Manufacturing
- Automated visual inspection
- Assembly worker coaching and safety
- Quality control
- Facility safety

Learn More

Hospitals
- Privacy-protected patient behavior insights
- Safety and patient fall alerts
- Handwashing verification for surgical teams
- Campus-operations optimization

Learn More

Higher Education
- Campus-usage insights for planning
- Building and classroom utilization optimization
- Campus safety and testing fraud detection
- Student experience and education quality enhancement

Learn More

Stadiums
- Concession-operations optimization
- Customer-experience metrics and enhancement
- Safety from violent offenders and drone intrusion
- Queue detection and waiting-time tracking

Learn More

Buildings and Facilities
- Room and facility utilization optimization
- Parking and mobility management and enhancement
- Facility security and intrusion or tailgating alerts
- Worker and visitor analytics and alerts

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Retail
- In-store customer behavior and preferences
- Queue analytics and alerts
- Product interactions and dwell-time alerts
- Store layout and messaging optimization

Learn More

The use of video in these wide-ranging applications is creating an incredible amount of new data that needs to be managed differently than other data.

Growth
Over 120 million cameras were shipped in 2017, with nearly 30 million of them being HD.

Source: Top Video Surveillance Trends for 2017

Management
Video data needs to be managed differently than other data types, due to data file size and the speed that video files are produced.

How Can You Get All the Benefits of Intelligent Video?

Hitachi provides Lumada Video Insights, an end-to-end video solution to help organizations across industries and geographies build smart spaces to reach their desired outcomes.

Data Capture
Smart cameras and edge gateways gather new information about the world around us and deliver intelligence, storage, transcoding and compression. They use WiFi or cellular connectivity to gain visibility in the most demanding environments. 3D lidar adds granular information without collecting PII.

Data Storage and Management
Built-for-video solutions support the unique requirements of video data, to ensure you have a solid data foundation for video analytics and analysis.

Data Integration
Disparate systems, data sources and video management systems (VMSs) can be unified into a single view, to provide comprehensive insights into operations.

Data Visualization and Analytics
Geospatial visualization of unlimited layers of data from objects, vehicles, buildings, cameras, sensors and statistical information, along with powerful analytics dashboards provide critical insights and alerts.

The Hitachi Advantage
- **Outcomes:** Pre-integrated, turnkey solution provides you with the insights you want, without the integration risks that come with managing multiple vendors.
- **Experience:** Industry expertise in delivering smart spaces globally and in some of the most demanding environments.
- **Growth:** Hitachi's Lumada solutions for digital innovation provide a portfolio of IoT solutions to address multiple customer challenges, including predictive maintenance and guided repair.
- **Trust:** Social Innovation is Hitachi's mission – to deliver social and business value through technology – and Hitachi is recognized as one of the most ethical companies in the world.

See how Lumada Video Insights can help your organization become safer, more efficient and more customer focused. LEARN MORE

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