Deep Learning
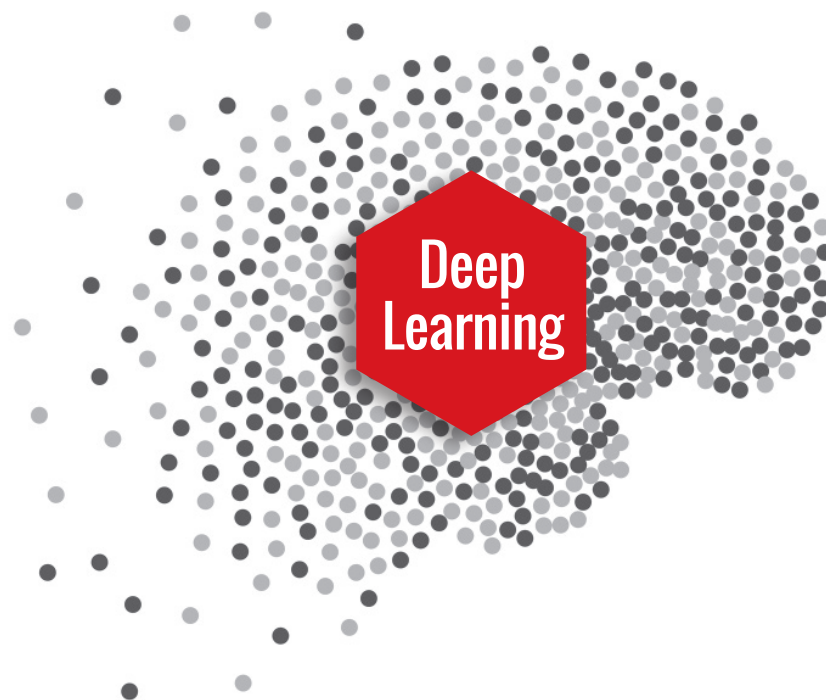# Solutions

Deep Learning Technology

In this ever-expanding era of Surveillance Data Technology (SDT), deep intelligence will become the foundation for the security industry. Technologies that "learn" will become more common and more powerful. This trend will strengthen critical security efforts in every sphere. Now, Hikvision's DeepinView Cameras and DeepinMind NVRs will lead the way in this new world of surveillance technology by making invisible intelligence visible for users, and then putting that intelligence to good use.

Deep
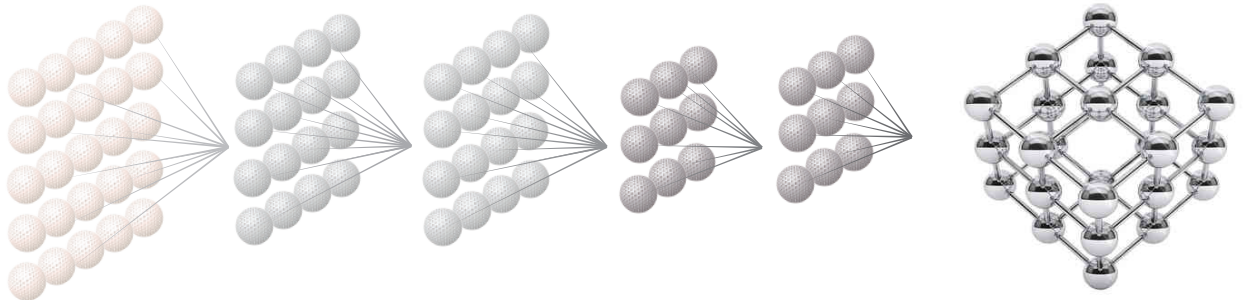Learning

Advantages of Deep Learning

1. Traditional Intelligent Algorithm

The number of video surveillance devices and the sheer amount of data are both rapidly increasing in their own rite, while the traditional intelligent algorithm continues to operate only on the surface level. Current systems suffer from:

01 Low Accuracy

02 Poor Environmental Suitability

03 Fewer Recognition Types

2. From "Shallow" to "Deep"

The algorithmic model for deep learning has a much deeper structure than the two 3-layered structures of traditional algorithms. In deep learning, an original signal passes through layers of processing; next, it takes a partial understanding (shallow) to an overall abstraction (deep) where it can perceive an object.

3. From "Artificial Features" to "Feature Learning"

Deep learning does not require manual intervention but relies on a computer to extract features by itself. The more features there are, the more accurate the recognition and classifications will be.
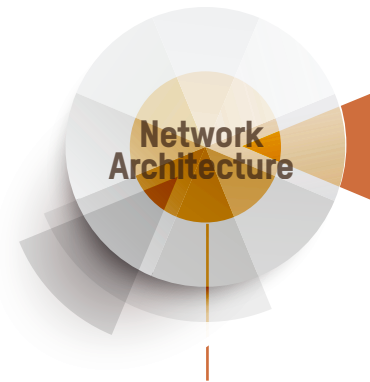
Key Factors of
Deep Learning

The rapid development of GPUs, supercomputers, cloud computing, and other high performance hardware platforms has made deep learning possible.

Scale of Data

Computing Power

Network Architecture

User experience has improved and more users are involved, facilitating a larger scale of data. With such a large amount of quality training data, object pattern recognition models will become more accurate for video surveillance use.

Through the constant optimization of deep learning algorithms, better target-object recognition is continually being achieved.

Key Features of Deep Learning

Facial Recognition is only the beginning for Deep Learning features. With analytics that take business solutions into the next century, and with automatic alarm accuracy above 90%, this technology is a step above and beyond anything video surveillance as you know it. Hikvision's Deep Learning technology filters out insignificant objects and movements in a scene that would trigger normal alarm systems.

Vehicle data gets recorded and shapes the database to perform numerous security functions. People Counting systems give businesses an advantage in marketing and conversion efforts. Hikvision's solutions add value on multiple levels.
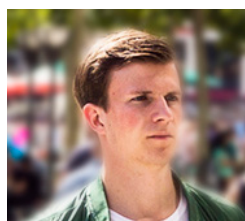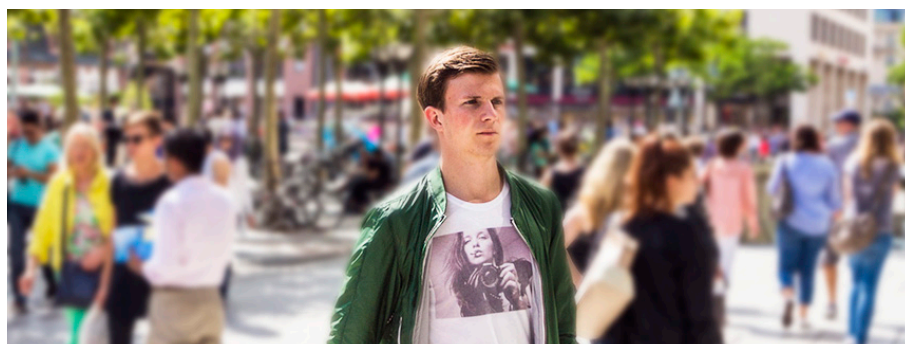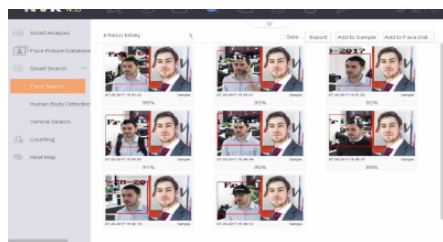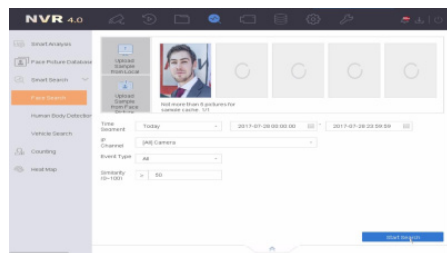
95%

Similar

1. Facial Recognition

Facial Recognition software will analyse images and determine the presence of a human face. When a face is detected, the system captures its position, size, and expression. The video stream will judge whether there is a human face. If so, the position, size, and main features will be recorded. Identifying characteristics can be obtained from this information. When compared against recorded human faces in a database, a face can be identified. Facial comparison is the process by which structured data information operates after data modeling and analysis for the human face.
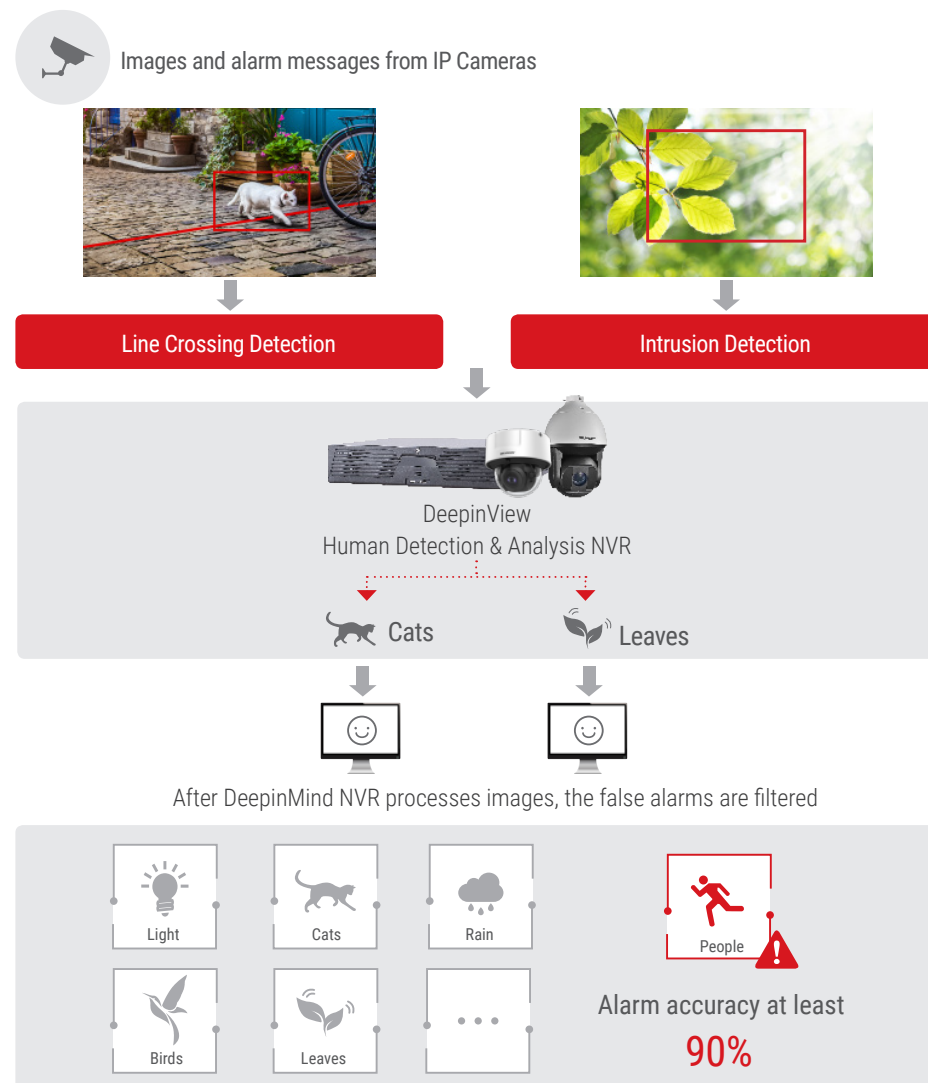

95% Similar

Note: Facial Detection will be available in late 2018

2. False Alarm Filter

The False Alarm Filter enables the system to perform secondary recognition for human body targets in human detection events (line crossing detection, intrusion detection), effectively reducing the false alarms caused by shaking leaves, shadows, light variations, vehicles, small animals, etc.

Images and alarm messages from IP Cameras

Line Crossing Detection   Intrusion Detection

DeepinView
Human Detection & Analysis NVR

🐈 Cats   🌱 Leaves

After DeepinMind NVR processes images, the false alarms are filtered

Light   Cats   Rain   People

Birds   Leaves   ...
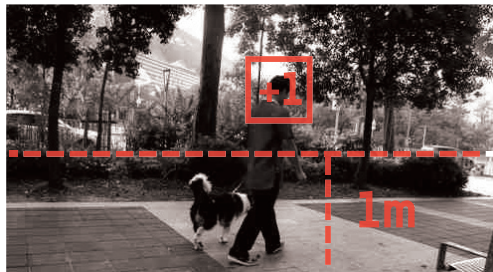
Alarm accuracy at least
90%

3. People Counting

The People Counting function counts people entering, exiting and passing by a specific scene, such as in a supermarket or museum where large crowds move through on foot.

Good Anti-Interference Ability

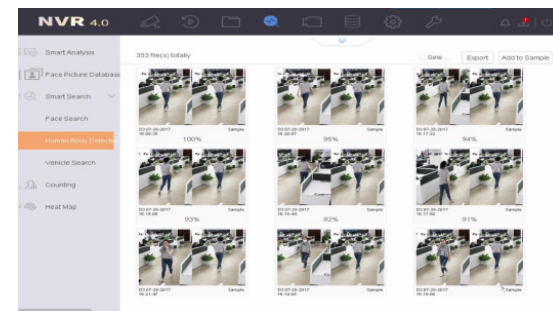Height Filtering
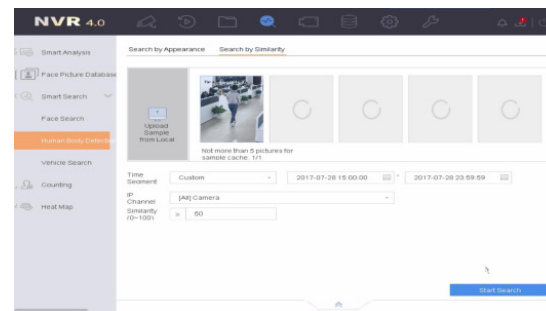

Loitering Filtering

4. Vehicle Structured Data

Vehicle Structured Data refers to a bivariate table formed by extracting the vehicle's license plate number and is used for vehicle information retrieval.

5. Human Body Search

The search by human body picture feature enables the system to use a provided human body picture to find matching images and information in recorded footage.

Applications
Selected Products

Customer Behaviour
- People Counting: Identify peak hours and days and assign staff accordingly. Use together with POS data to calculate conversion rates.
- Dual-Lens People Counting Camera iDS-2CD6810F/C

Loss Prevention
- Facial Recognition: Loss prevention managers can be notified when suspected "habitual thief" visits. His or her face can be shared across all chain stores.
- Dual-lens facial recognition iDS-2CD8426G0/F

Intrusion Alarms
- Accurate human body detection: Deep Learning technology dramatically increases the accuracy of intrusion, it eliminates the influences from animal, shaking leaves and etc.
- DeepinView Human detection cameras DS-2CD7X26G0

RETAIL

Brick-and-mortar retailers need to better understand their customers' behaviors to boost competitiveness against online competitors. And loss prevention plays an important role in boosting profits. Deep Learning technology helps users accomplish these tasks – and much more – providing advanced analytics and video surveillance.

Residential buildings, industrial plants, stadiums – there are many types of structures, but security is the one thing that each one requires. Access control and perimeter protection are the most common requirements. Deep Learning technology establishes more accurate intrusion alarms and more convenient access control.

BUILDING

Human Body Detection and Analysis

- Hikvision's DeepInmind Series NVRs are the first embedded NVR based on a deep learning algorithm executed by its GPU, making it faster and more accurate than conventional CPUs. This NVR effectively filters out alarms triggered by animals and inanimate objects, with greater than 90% accuracy.
- Deep learning has come to the security industry in this amazing video recording unit iDS-9632NXI-I8/8S(/16S), iDS-7716(32)NXI-I4(/16P)/8S

Intrusion Alarms

- Accurate human body detection: the Deep Learning technology dramatically increases the accuracy of intrusion and eliminates the influences from animal, shaking leaves and etc.
- DeepinView Human detection cameras DS-2CD7X26G0

Facial Recognition

- Control building access using facial recognition cameras and get alarmed of suspicious visitors.
- Facial recognition technology helps to eliminate buddy clocking and timesheet abuse.

SMART CITIES

Effective protection of citizens, their property and public areas, is a concern for city authorities around the world. In Safe City Project, Hikvision's Deep Learning technology is adopted to identity specific personnels and analyze human and vehicle behaviors. This can be used for locating a fugitive at large, finding lost people, preventing potential crimes, detecting parking violations, etc.

Facial Recognition
- Indoor Dual-Lens Facial Recognition Camera iDS-2CD8426G0/F
- Facial Recognition NVR iDS-9632NXI-I8/4F

Intelligent Traffic
- DeepinView Parking Violation Detection Camera iDS-2VS235-F836
- Traffic event detection PTZ
- Vehicle parking detection

OTHERS

AIRPORTS

GOVERNMENT SECTORS

RAILWAY STATIONS

PUBLIC SQUARES

CUSTOMS & BORDER CONTROL

Product Showcase

Model	Picture	People counting	Facial recognition	Human Detection -False Alarm Filter; Line Crossing Detection, Intrusion Detectwion, Region Entry/Exit
iDS-2CD6810F/C		●		
iDS-2CD6810F-IV/C		●		
iDS-2XM6810F-I(M)/C		●		
DS-2CD7126G0/L				
iDS-2CD8426G0/F			●	
iDS-2CD8426G0/B				
iDS-2PT9122BX-DE/S iDS-2PT9142BX-DE/S				
iDS-2VS235-F836				
DS-2DF8xxxIX DS-2DF6xxxX				●
DS-2CD7xxxG0				●

Loitering	Queue	Target capture (face, human, vehicle)	LPR	Parking Violation Detection
	●			
●				
		●		
			●	●

Product Showcase

iDS-2CD6810F/C DeepinView
DeepinView Indoor Dual-Lens
People Counting Camera

- Indoor dual-lens people counting
- People counting
- Stereo vision

Scenario
Buildings/airports

iDS-2CD6810F-IV/C DeepinView
DeepinView Outdoor Dual-Lens
People Counting Camera

- Outdoor dual-lens people counting
- People counting
- Stereo vision

Scenario
Stadiums/parks

iDS-2XM6810F-I(M)/C DeepinView
DeepinView Mobile Dual-Lens
People Counting Camera

- Mobile dual-lens people counting
- People counting
- Stereo vision

Scenario
Buses/trains

DS-2CD7126G0/L-I DeepinView
DeepinView Dual-Lens Queue
Detection Camera

- Dual-lens queue detection
- Line-up queue detection
- Stereo vision

Scenario
Stores

iDS-2CD8426G0/F
DeepinView Dual-Lens Facial
Recognition Camera

- Dual-lens face recognition
- Onboard face recognition, massive face library with up to 60,000 faces.
- H.265 Stereo vision

Scenario
Buildings/airports/stadiums

iDS-2CD8426G0/B DeepinView
DeepinView Dual-Lens Behavior
Analysis Camera

- Dual-lens behavior analysis
- Loitering, fall down, etc.
- Stereo vision

Scenario
Banks, hospitals, schools

iDS-2PT9122BX-DE/S
iDS-2PT9142BX-DE/S
DeepinView PanoVu Camera

DeepinView

- PanoVu
- Works with DeepinView NVR to create accurate human and face comparisons.

Scenario
Intersections/airports/public/squares

iDS-2VS235-F836
DeepinView Parking Violation
Detection Camera

DeepinView

- Traffic event detection PTZ
- Vehicle parking detection

Scenario
Streets

DS-2DF8xxxIX
DS-2DF6xxxX
DeepinView Human
Detection Cameras

DeepinView
DarkFighter

- Human detection
- False alarm filter; line crossing detection, intrusion detection, region entry/exit
- PTZ

Scenario
Public/squares/streets

DS-2CD7xxxG0
DeepinView Human
Detection Cameras

DeepinView
DarkFighter

- Human detection
- False alarm filter; line crossing detection, intrusion detection, region entry/exit

Scenario
Public/squares/streets

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