

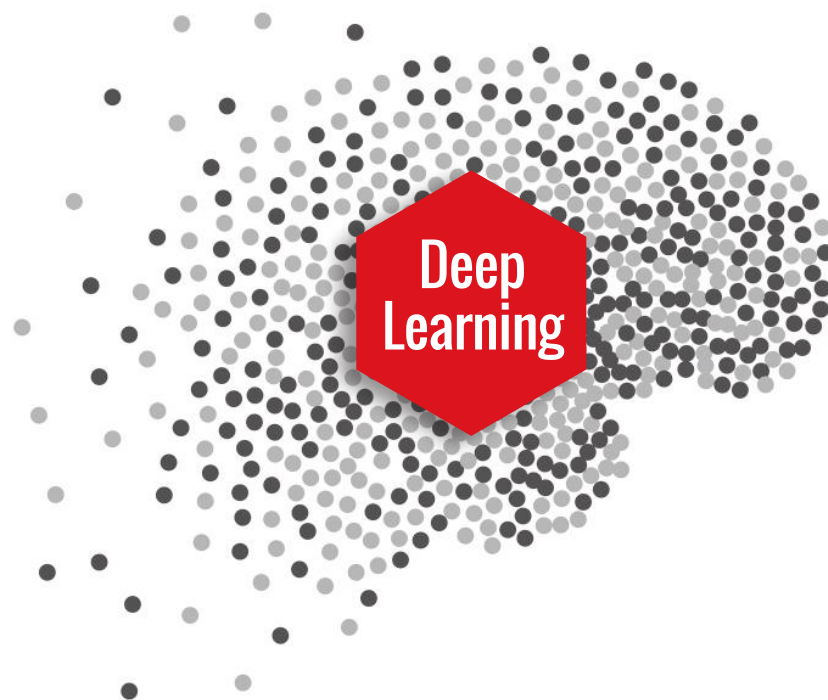


Deep Learning Solutions

HIKVISION[®]

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.



Advantages of Deep Learning

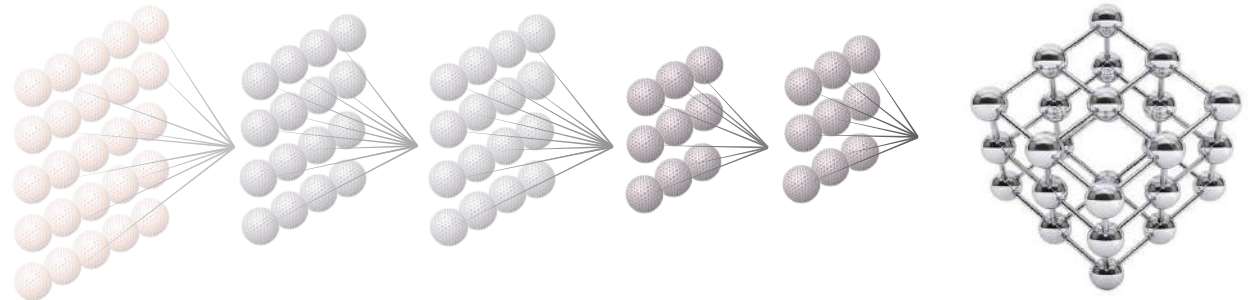
1. Traditional Intelligent Algorithm

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:



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”

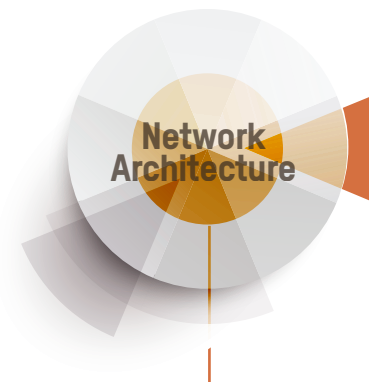
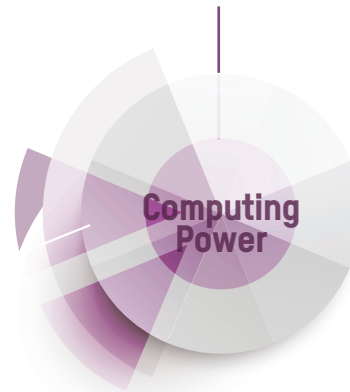
Deep learning does not require manual intervention but relies on a computer to extract features by itself. The more features there are, the more accurate the recognition and classifications will be.



Key Factors of Deep Learning



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



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.



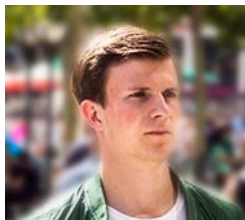
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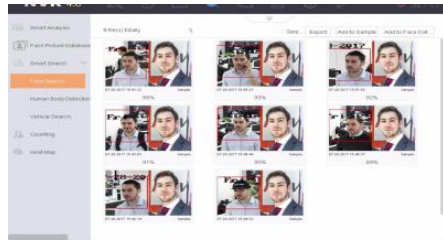


1. Facial Recognition

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.



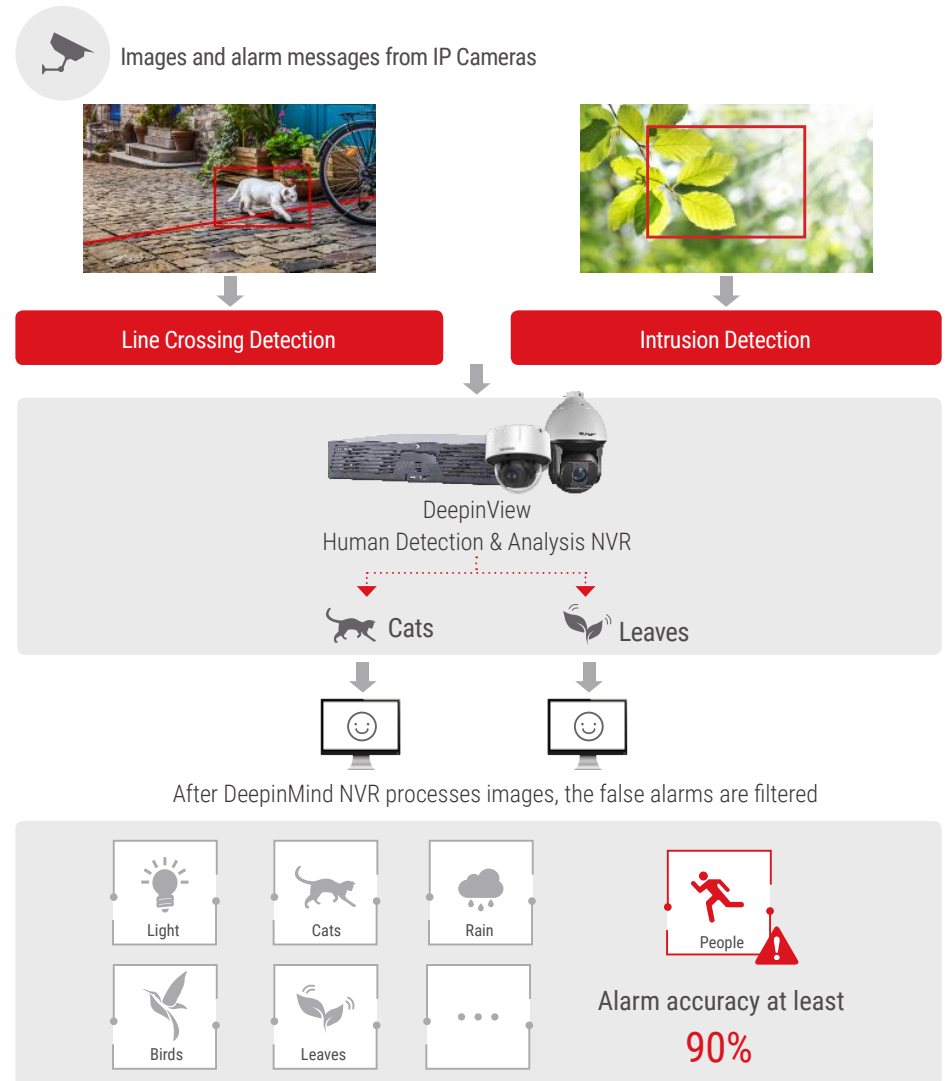
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Note: Facial Detection will be available in late 2018

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.

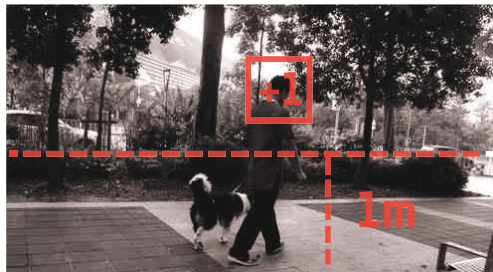


3. People Counting

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



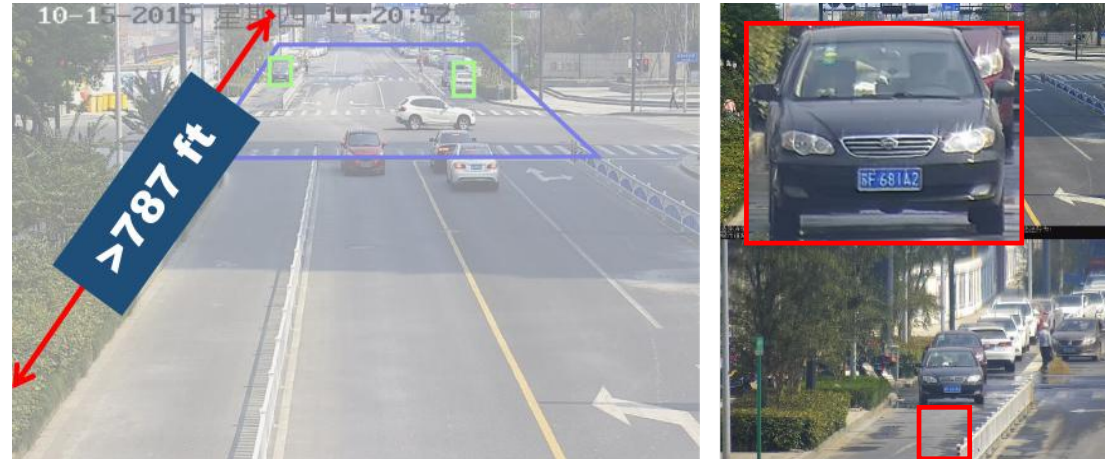
Height Filtering



Loitering Filtering

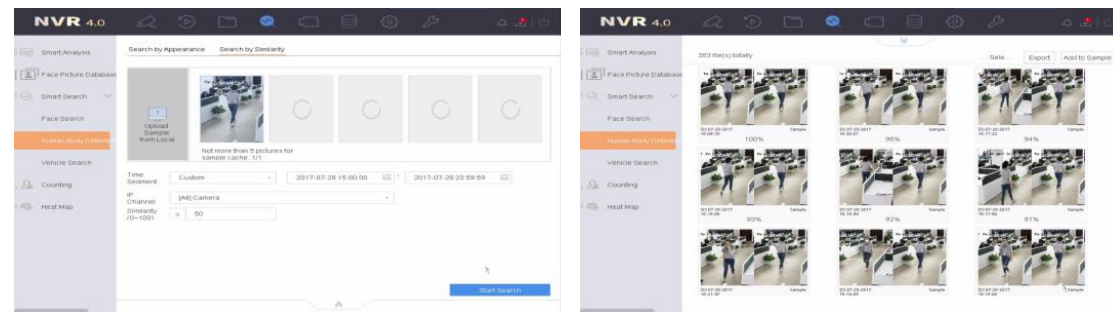
4. Vehicle Structured Data

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

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.



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

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

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- 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 identify 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