



a2 Technology

Advanced Video Analytics

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TRAFFIC SAFETY 2.0

HOW VIDEO ANALYTICS AND AI ARE TRANSFORMING THE WAY WE MOVE



TRAFFIC SAFETY 2.0: How Video Analytics and AI are Transforming the Way We Move

Video analytics and AI have revolutionized the approach to traffic safety. These cutting-edge technologies process large amounts of data from cameras and sensors in real time, providing a more accurate understanding of traffic patterns and potential hazards. Video analytics and AI have made our roads safer and more efficient by preventing accidents and optimizing traffic flow. With the increasing use of cameras in traffic monitoring and control, the importance of video analytics and AI in traffic management cannot be overstated. These technologies detect and track vehicles breaking traffic laws, predict accidents, and improve overall transportation planning by identifying areas where new roads or public transportation routes are needed.

At a2 Technology, with over a decade of expertise in Video Analytics technology, we have witnessed the positive impact of video analytics and AI on traffic safety firsthand. Our commitment to this technology extends beyond just detecting violations and predicting accidents, as it also plays a crucial role in overall transportation planning. We strive towards a future where accidents and traffic jams are greatly reduced and traffic flow is optimized, thanks to the power of video analytics. Our goal is to continue leveraging this technology to ensure the safest and most efficient transportation system possible.

Let's now examine some real-world use cases that demonstrate the capabilities of video analytics and AI in traffic management.

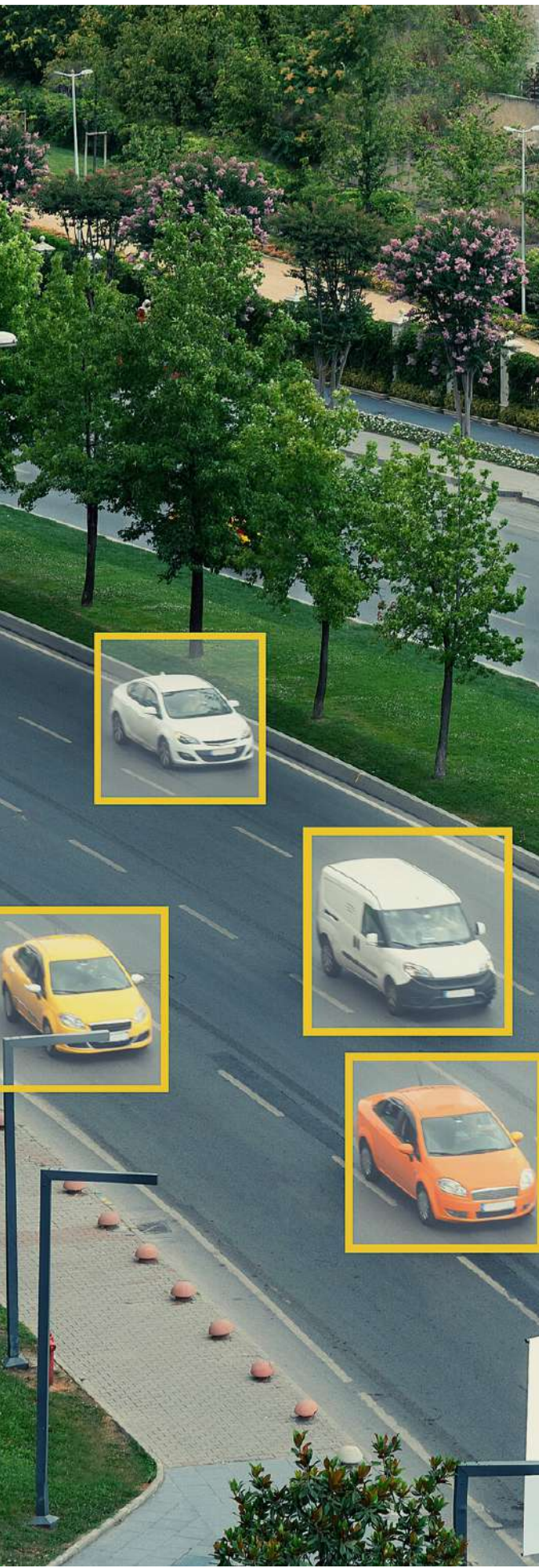
Video Analytics and AI Enhance Real-Time Monitoring

Stop just passively monitoring videos, but use Video Analytics to gain valuable insights from the footage.

The use of video analytics and AI in traffic management is crucial due to their ability to process large amounts of data accurately and in real time. Traffic cameras and sensors can monitor the movement of vehicles and pedestrians, quickly identifying potential issues and alerting traffic control centers for immediate action.

By analyzing the data from these cameras, video analytics provide a comprehensive understanding of traffic patterns, detecting hazardous behavior such as red light running or illegal turns, reducing the risk of accidents. The technology also predicts areas prone to accidents, allowing traffic control centers to proactively make adjustments to minimize collision incidents.

Moreover, video analytics and AI algorithms help to optimize traffic flow, adjusting traffic lights and signs in real time based on traffic patterns. This leads to reduced congestion and improved overall efficiency, including shorter travel times, lower fuel consumption, and reduced emissions, benefiting both drivers and the environment.



Predicting Accidents

Video analytics and AI can be used for automatic incident detection to prevent accidents. This can include detecting stopped vehicles, which can indicate a potential breakdown or emergency situation on the road. If a stopped vehicle is detected, traffic control centers can take action to warn other drivers and redirect traffic to avoid a potential collision.

Wrong-way driving detection is another important incident detection capability provided by video analytics. This can help to prevent head-on collisions and other serious accidents caused by drivers entering a roadway in the wrong direction.

Sudden speed drops, too slow or too fast passing, dropped/abandoned objects, animals, or pedestrians in tunnels can be another incident that video analytics and AI algorithms can detect and prevent accidents. These incidents can cause serious accidents if not detected and managed in real time. The system can detect these incidents and alert traffic control centers to take action to redirect traffic and avoid collisions.

Fire and smoke detection is also an important incident detection capability provided by video analytics and AI. This can help to prevent accidents and protect lives by detecting fires and smoke in tunnels and other enclosed spaces.

Overall, video analytics and AI can maximize road safety by detecting and managing incidents in real time. And we are proud to apply our Automatic Incident Detection solution a2-VCA to over 60 tunnels, more than 300km of highspeed railways, metro lines, and risky sections of highways.



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Identifying Hazardous Areas

Video analytics and AI can be significant tools in identifying hazardous areas on our roads, and taking proactive measures to reduce the risk of accidents. By monitoring traffic patterns in real-time, video analytics can be used to identify areas where accidents are more likely to occur. This can help traffic control centers to take proactive measures to reduce the risk of collisions, such as adjusting traffic lights or signs in real-time.

One of the key advantages of video analytics is its ability to process large amounts of data quickly and accurately. This means that traffic cameras can be used to monitor the movement of vehicles and pedestrians in real-time, identifying potential problems and alerting traffic control centers to take action. For example, video analytics can be used to detect areas where vehicles are frequently speeding or where there is a high concentration of pedestrian or bicycle traffic, and take measures to improve safety in these areas.

In addition to identifying areas where accidents are more likely to occur, video analytics can also be used to identify areas where traffic congestion is most severe, and take measures to reduce it. This can include adjusting traffic lights or signs in real-time, to optimize traffic flow and reduce congestion, as well as identifying areas where new roads or public transportation routes are needed.

Overall, the ability of video analytics to monitor traffic patterns and identify hazardous areas can be critical for preventing accidents and making our roads safer. By identifying areas where accidents are more likely to occur, traffic control centers can take proactive measures to reduce the risk of collisions, and make the necessary adjustments to traffic lights and signs in real-time, to improve overall traffic flow and efficiency. Furthermore, the ability of video analytics to identify areas where pedestrian or bicycle traffic is high, or areas where large vehicles are having difficulties, can help in designing infrastructure that increases safety for these vulnerable road users.

Enforcing Traffic Laws

Video analytics can play a crucial role in enforcing traffic laws and maintaining safe roads. For example, video analytics can be used to detect and track vehicles that are breaking traffic laws, such as running red lights, making illegal turns, speeding, and wrong parking. This can help to reduce the number of accidents caused by reckless or negligent drivers, as well as improve overall traffic flow.

The use of video analytics in enforcing traffic laws is becoming increasingly important. The technology can detect speeding by comparing the speed of a vehicle to the speed limit on a particular road, alerting law enforcement officials to take action when necessary. For instance, if a vehicle is caught traveling over the speed limit, the system can automatically generate and send the violation package including evidence pictures, video & metadata, notifying the authorities to take action against the violator. Similarly, video analytics can be used to detect illegal turns, which can cause accidents if a driver misjudges the speed or position of other vehicles.

As an ANPR application, video analytics can also be used to identify and track stolen vehicles, helping law enforcement to recover stolen vehicles more quickly and easily.

The use of video analytics and AI in enforcing traffic laws also has the potential to reduce the burden on law enforcement. By automating the process of detecting and tracking vehicles that are breaking traffic laws, video analytics and AI can help to free up law enforcement resources, allowing them to focus on more serious crimes. This can help to improve overall public safety and make our roads safer for everyone.

We are delighted to have served hundreds of cities across several countries by providing our a2-Enforcement and a2-ANPR product families to support their law enforcement forces.



Optimizing Transportation Planning

In addition to improving safety and efficiency on the roads, video analytics and AI can also be used to improve overall transportation planning. For example, AI algorithms can be used to analyze traffic patterns and identify areas where new roads or public transportation routes are needed. This can help to ensure that transportation infrastructure is being used as efficiently as possible.

Additionally, AI can also be used to predict future traffic patterns and identify areas where population growth or economic development is likely to occur, enabling transportation planners to anticipate future transportation needs and make long-term plans accordingly. Furthermore, AI can optimize routes for public transportation, such as buses and trains, reducing travel time and improving overall transportation efficiency. Overall, the use of AI in transportation planning ensures transportation infrastructure is utilized efficiently, reducing traffic congestion, improving traffic flow, and making the transportation system more sustainable.





Conclusion

Video analytics and AI technologies hold great promise in improving the safety and efficiency of our roads. By utilizing these tools, we can strive towards a future with fewer accidents, less traffic congestion, and more optimized traffic flow. AI algorithms can help detect and prevent accidents, analyze traffic patterns, suggest alternative routes, optimize transportation planning, and reduce the risk of collisions. With the ongoing development of these technologies, our roads can become safer and more efficient, leading to a better quality of life for all.

We would be more than happy to meet and chat with anyone who is curious about our technology and its potential to improve the safety and efficiency of our transportation systems. Let's work together towards a better future for all!

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