

Solution Brief

Logistics and Tracking
Artificial Intelligence

The Intel logo is positioned in the top right corner of the header image. It consists of the word "intel" in a lowercase, sans-serif font, with a small registered trademark symbol (®) to its upper right. The background of the header is a blurred image of an industrial setting with a worker in a hard hat and safety vest in the foreground.

Demystifying Artificial Intelligence with More Accessible and Versatile AI Video Analytics

The Aotu® BrainFrame® AI Platform is an AI Vision platform that harnesses the power of Intel technologies to reduce the complexity of AI video analysis integration and make cutting-edge AI capabilities more accessible across a multitude of manufacturing and industrial environments.

AOTU

About Aotu®

Aotu® is a Silicon Valley-based start-up dedicated to innovation in the AI domain with expertise in computer vision, deep neural network algorithms, and software engineering. Its product, BrainFrame®, has been deployed in multiple verticals such as industrial/IoT and enterprise/administration. Aotu® believes smart machines give people a better opportunity to improve the world around them and they strive to be the leader in rapid smart vision deployment, bringing advanced AI to production with unprecedented ease to improve people's lives with machines that see and understand the world.

Navigating Artificial Intelligence Deployment and Reaping the Benefits of Video Infrastructure and Data

The use of video cameras by organizations and businesses across the globe is nothing new and the number of organizations using them is only increasing. IHS Market estimated that in 2019 there were a total of 770 million cameras installed worldwide with the expectation that 2021¹ would represent a milestone in the market by reaching a total of 1 billion cameras. As you can imagine, such a large number of cameras generate a massive trove of video data. However, previously this data typically was overlooked, and these cameras were mainly used for security purposes that relied on manual monitoring methods of live video feed.

Today, organizations are increasingly looking for ways to maximize the value of their video data beyond traditional uses. Businesses recognize that simply gathering video footage is leaving valuable insights on the table and they are not realizing the true value of their video data - yet how to realize this value poses a significant challenge. Even when organizations collect adequate video data, figuring out what to do with that data – and how to do it – is extremely difficult. Many lack the tools and manpower they need to make efficient and profitable use out of what they are gathering.

The answer lies in the power of artificial intelligence, which when utilized properly unlocks the true potential created by video data - and businesses are recognizing this potential. The global AI video analytics market is expected to grow rapidly, reaching an estimated \$82 billion by 2029, an increase from just \$9 billion in 2021². Capabilities that have immediate and transformative business benefits such as automating manual tasks, gaining valuable operational insights, and improving daily efficiencies are all made possible with AI video analytics.

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However, implementing AI video analytics that meet the unique needs of an organization can be expensive and time consuming and developing the right AI algorithm requires expertise to code and train algorithms. Funding teams of data scientists and AI software engineers that are often needed to perform such tasks can be expensive and even inaccessible for some organizations.

While the potential of AI video analytics is high, today's market is fragmented and non-standardized, which creates barriers of entry for end-customers and complex hurdles for system integrators, both of whom might not know where to start in the process of implementing highly complicated solutions that require significant upfront investment. This leads organizations to fall back on manual video practices and leaves unused data on the table.

Empowering System Integrators with Reliable and Accessible Video Analytics: The Aotu®* BrainFrame®* Solution

Recognizing the massive potential of video data, Aotu®* sought out to empower system integrators, and their customers, with a video analytics platform that reduces the complexity of implementing AI. The result was the BrainFrame®* AI Solution, which utilizes cloud, edge, and hybrid capabilities to deliver an operating system for computer vision where AI algorithms are encapsulated in an open-source format.

Traditionally, implementing AI video analytics is a process that requires the development of deep learning algorithms and software tailored for the specific needs of a customer. This process is time consuming and often requires prohibitively expensive consultation with data science teams that have deep expertise in software engineering, computer vision, and deep learning. With BrainFrame®*, customers can avoid high deployment costs and integrators can equip their customers with transformative AI capabilities in less time and with less risk.

Key Customer & Integrator Benefits



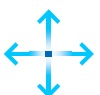
Reduce time to market and achieve faster insights: With plug-and-play downloadable algorithms, system integrators can deploy the BrainFrame®* solution within a customer's environment in mere days, opposed to traditional training and deployment which can take months or years. This rapid deployment ensures end customers will begin reaping the benefits of AI in a short time and helps integrators create stronger partnerships with their customers.



Reduce costs and complexity: BrainFrame®* uses an approach to AI algorithms that is no-code or low-code, meaning deployment of deep learning algorithms can start without external data experts and AI software engineers. Integrators and end customers can enjoy reduced risk since there is no significant upfront investment involved. There is no massive overhaul or long integration process required and BrainFrame offers the option to integrate with a customer's existing infrastructure.



Increase profitability: Once the algorithms are up and running, end customers are immediately equipped with key capabilities that drive profitability. Automating video analysis removes the need for manual inspection and frees up staff to attend to more pressing matters. The simple and rapid deployment also means that integrators can increase their own profitability by helping a greater number of organizations modernize their video analysis practice.



Scale into the future: The open-source algorithms included with BrainFrame®* cover a wide variety of use cases and industries, opening the door for new opportunities as a customer grows their business. Customers can continue delivering value as their business grows into the future regardless of what market changes and organizational developments they incur. Furthermore, integrators can help guide their customers as they expand their current market or help them explore new horizons while ensuring a powerful AI platform is at their side.

How Aotu®* BrainFrame®* Works

The Aotu®* BrainFrame®* Solution equips customers with sophisticated AI video capabilities, yet its functional usage is surprisingly simple thanks to its open-source approach including graphics user interface (GUI) and REST APIs for applications and algorithms encapsulation. Once BrainFrame®* is connected to a customer's video infrastructure, it is built to easily connect to hundreds, even thousands of live video feeds in just hours. This process requires no coding and enables plug-and-play compatibility with leading stationary IP cameras, video surveillance, video management systems, making BrainFrame®* compatible with most applications.

As easy as installing an app from the App store, BrainFrame®* uses VisionCapsules®, the revolutionary interoperable AI standard that enables both the creation of AI algorithms and the ability to apply multiple algorithms to a single video source at once. This enables a drag-and-drop functionality where customers simply choose an algorithm that fits their desired use case and drop it on their live video feed. Additionally, these VisionCapsules®* provide complete support for the Intel® Distribution of OpenVINO™ toolkit and fully leverages the optimization and acceleration offered by the toolkit on Intel® Xeon® processors and Intel® Core™ processors.

The drag-and-drop VisionCapsules®* combined with the power of Intel technology transform simple video feeds into an intelligent dashboard in seconds with real-time analytics that deliver

data-driven insights. BrainFrame®* enables object detection, tracking, and classification with smart zones and lines in regard to people, vehicles, and factory production lines. A simple use case can be behavior detection such as smoking at a gas station or campground. Once these anomalies are detected, BrainFrame®* can alert staff in real-time or incorporate the alerts into business intelligence systems to inform better decision making.

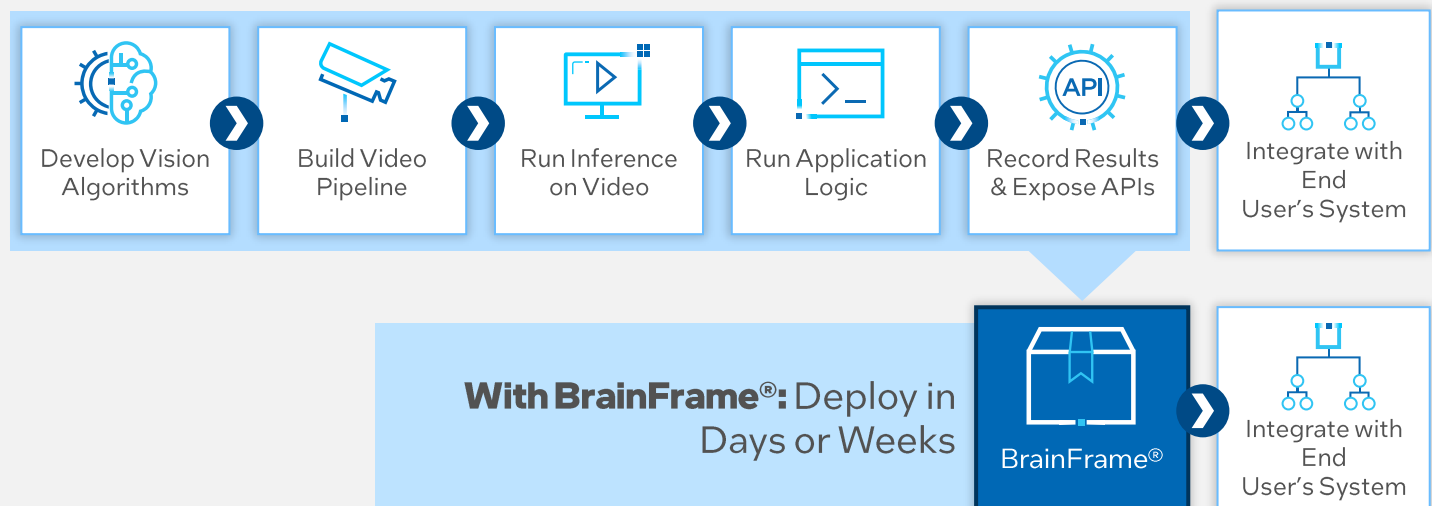
While complex AI algorithms are instantly delivered to the customer's fingertips, BrainFrame®* also provides an open door for customers who want to quickly and simply develop their own algorithms to fit a more specific use case. This provides the opportunity to grow with BrainFrame®* as integrators help their customers grow their business and explore new opportunities in the future.



— Solution Diagram —

Reduce Time-To-Market for Your Solution

Usual Deployment Process: 9-18 months



BrainFrame®* Offers SIs Simple And Flexible Deployment for Their Customers

In order to equip customers with the power of the BrainFrame®* Solution, system integrators begin a simple and easy deployment process. After gaining an understanding of the customer's needs such as location environment and number of cameras, deployment begins by connecting cameras in the customer environment connected to an edge Industrial PC or server with the BrainFrame®* software installed. If customers are interested or it works best for their business model, cameras can be connected directly to the cloud. In this case, the BrainFrame®* and Application Server can be deployed to the cloud or a private data center on-premises.

One major benefit both system integrators and end customers can enjoy is the solution's ability to work with pre-existing camera infrastructure. BrainFrame®* does not require its own specific camera hardware, so customers do not have to worry about incurring an expensive overhaul of their video infrastructure.

Once connection and software installation has been complete, customers can immediately begin utilizing their video footage to gain AI generated insights using the drag-and-drop VisionCapsules®* that fit their use case and desired application. From start to finish, the deployment of the Aotu BrainFrame®* Solution is simple and flexible, making it easy to deploy in most customer environments and works to fit their specific needs.

			
Transport	Factory	Administration	Retail
- Vehicle identification and information at warehouse or work site - Forklift location and speed enforcement - Pedestrian and traffic segregation	- Production line inspection - Defect inspection - Workspace & assets management - Smart vision machinery - Safety compliance & enforcement, PPE program	- Checking attendance - Identity-based location verification, smart zones & lines, alarms - Monitor for behaviors & compliance, including smoking, phoning, off duty, sleeping, etc.	- Point of Sale information - Customer demographics - Queue management - Detecting behaviors: loitering, smoking, etc. - Store layout optimization

Customer Success Story: Automating Worker Safety with the Combined Power of Aotu®* and Intel



Challenge: A beverage bottler factory of a globally recognized Fortune 500 company was looking to transform various manufacturing and safety inspection processes at ten regional factories. After realizing there were more effective ways to manage occupational safety, the company looked to implement machine vision and AI to improve the way they managed factory safety.



Solution: Answering this call, Aotu®* and Intel joined forces to develop an intelligent video solution for factory by harnessing the power of 11th Generation Intel® Core™ processor-based Industrial PCs, Intel® Xeon® Scalable Processor-based edge servers, and the Intel® Distribution of OpenVINO™ Toolkit. Combined with the drag-and-drop functionality of the Aotu deep learning algorithms, the bottling factory was equipped with powerful AI capabilities within their factories.



Result: After deploying the Aotu®* BrainFrame®* solution, the bottling factory was able to achieve:

- 80% reduction³ in video review and verification workload.
- 60% reduction³ in cost related to safety compliance and workload
- A proactive approach to their safety and inspection practices

Intel Technologies Working Together To Level Up the BrainFrame®* Solution

In developing the BrainFrame®* Solution, Aotu®* chose to partner with Intel to set up the solution to be as powerful as possible. Integrating the Intel® Distribution of OpenVINO™ toolkit, BrainFrame®* supports AI algorithms that are fully optimized for implementation across Intel hardware, including industrial PCs powered by Intel® Core™ processors, servers based on Intel® Xeon® processors, and Movidius™ VPUs for enhanced visual processing. The Intel® Distribution of OpenVINO™ Toolkit is a leading ingredient for rapidly developing deep learning vision applications and supports industry AI frameworks while making it easy to deploy deep learning inference into application with standard and customer layers.

BrainFrame®* utilizes VisionCapsules®*, which is an open format set of tools that facilitates the creation of portable algorithms that can be easily distributed and deployed. Aotu®* VisionCapsules®* are fully compatible with the OpenVINO™ toolkit and fully leveraged for the optimization and acceleration offered by the toolkit on Intel processors. This compatibility ensures that solutions based on Intel hardware are fully optimized for enhanced performance and that AI computing resources are fully utilized to ensure customers can get the most from their hardware investment. All of these elements work together to make a powerful combination that enables a world of AI capabilities such as object, people, and vehicle detection, tracking, classification, and much more.

In Summary

BrainFrame®* is designed to seamlessly integrate AI insights and realize the potential of video data within virtually any industry. With rapid deployment and simple algorithm application, system integrators can deliver transformative AI to their customers and begin developing partnerships with the potential for long-term scale, all in a single platform.

Learn More

- [Aotu®* Website](#)
- [Aotu®* and Intel Kinco Case Study](#)
- [Aotu®* and Intel Bottle Factory Case Study](#)
- [BrainFrame®* Introduction Video](#)
- [Intel® Distribution of OpenVINO™ Toolkit Product Page](#)
- [Intel® Core™ Processors Product Page](#)
- [Intel® Movidius™ Vision Processing Units \(VPUs\)](#)



Sources

1. [One billion surveillance cameras, CNBC, 2021](#)
2. [AI in Video Analytics Market, Maximize Market Research, 2022](#)
3. [Leading Bottling Company Automates Worker Safety, Intel, 2022](#)

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