




HOW COMPUTER VISION IS TRANSFORMING MANUFACTURING



The Video Intelligence Platform



The way we look at
Manufacturing is this:
the U.S.'s strategy
should be to skate
where the puck is going,
not where it is.

Tim Cook
CEO, Apple Inc.



INTRODUCTION

Gone are the days of frustrating manual monitoring and data collection in manufacturing. Now, modern factories are embracing Industry 4.0, and one of the most powerful tools (and potentially easiest to implement) in their arsenal is computer vision.

In the era of Industry 4.0, computer vision can play a crucial role in automating processes and improving overall production efficiency. It's no surprise that many manufacturers are investing

in computer vision technology to stay competitive in today's market.

Computer vision is a process that allows machines to "see" and interpret the images they capture, which enables tasks like quality control and process improvement. By constantly monitoring products, manufacturers can catch any issues before they become a larger problem.



We've gathered some of our favorite examples and use cases for how computer vision will be used to improve and transform manufacturing in 2023 and beyond. Check them out and let us know which would add the most value to your business.

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SAFETY

With over [400,000 injuries in manufacturing](#) in 2019, it's not surprising that factories are eagerly looking for new strategies to keep workers safe. Computer vision is proving to be one of the most powerful and consistent strategies for accomplishing this goal.

For example, in many manufacturing facilities, it's important for workers to wear safety equipment to avoid or minimize potential injuries.

However, sometimes people forget or choose not to wear the necessary safety gear, which can lead to costly accidents. Using video cameras including existing security cameras, the computer can provide advanced analysis of PPE (personal protective equipment). It's smart enough to know that different PPE is required in different areas and can deliver notifications (or even shut down machinery) when employees aren't wearing the right gear.

It's also possible for computer vision solutions to create safer environments by monitoring the relationship between people and equipment. For example, if a person was in the path of a forklift or if a person was inside a dangerous area near a piece of machinery.

Finally, computer vision can be used to monitor environmental condition indicators in factories, such as air quality and temperature, to ensure that they are within safe limits. This frees up human resources for more complex and valuable tasks.

In short, by monitoring the movement of people and objects, computer vision can be used to detect potential hazards and prevent accidents from happening.



QUALITY CONTROL

Computer vision is becoming an increasingly important tool for quality control in manufacturing. By tracking the position and orientation of objects as they move through the manufacturing process, factories can use computer vision to identify defects and problems that could affect the quality of the final product.

One way that computer vision is being used for quality control is by analyzing images of products as they are assembled. By identifying features such as color, shape, and size, factories can automatically detect errors in the assembly that could lead to a lower-quality product.

Computer vision can also be used to inspect products after they have been assembled. By scanning products for irregularities or defects, factories can quickly and easily identify any problems that need to be fixed.



One of the unique benefits of using computer vision for quality control is its accuracy. It can detect even the smallest defects in products, which helps to ensure that high-quality standards are maintained for irregularities or defects, so factories can quickly and easily identify any problems that need to be fixed.

PROCESS OPTIMIZATION

Process optimization is a critical focus for manufacturing and computer vision can be the perfect tool to help find big and small optimization opportunities. By tracking the position and orientation of objects as they move through the manufacturing process, factories can use computer vision to identify areas where the process could be improved.

One example of this is the use of computer vision to prevent micro stoppages. Often, these micro stops

are caused by misaligned, broken, incorrect, or missing objects in the process. Through monitoring the production line, computer vision can spot these anomalies earlier and notify the production team of their exact location and cause. Even if an anomaly gets through, computer vision is still able to identify when a given machine is stopped for too long, enabling faster response times. This can, of course, help to improve the efficiency of the manufacturing process and reduce the amount of time that machines are stopped.





Another popular use for computer vision is in analyzing process times on the line. This starts with capturing the current production duration for each stage in any process.

Armed with that information, you could begin crafting improvements and measuring process performance against the benchmarks. While these types of activities could be done manually, computer vision provides a more constant measurement and often eliminates the human error and bias that can sometimes be found in process optimization.

PREDICTIVE MAINTENANCE

Predictive maintenance in manufacturing gets significant attention – and rightly so as it can ultimately save organizations substantial money. By tracking the position and orientation of objects, factories can use computer vision to predict when parts are going to wear out and need to be replaced. This allows factories to plan for replacements in advance, preventing any unexpected downtime in the production process.

Additionally, computer vision can be used to monitor the entire manufacturing process for signs of wear or problems. By identifying patterns in the data collected by sensors throughout the factory, factories can use computer vision to predict when a component is going to fail or when an entire assembly line needs maintenance.



This type of predictive maintenance saves factories significant amounts of money (and headaches) in the long run by preventing expensive failures and downtime.

WORKER HEALTH

For some factories, worker posture and physical tasks - particularly repetitive tasks - are a double-edged sword. While those tasks are critical, it's equally important that workers perform them safely to avoid injuries and health issues.

From sick leave and doctor's appointments to worker's comp claims, poor worker health can be costly for manufacturers. Fortunately, computer vision can be used to monitor posture and movement patterns.

By constantly monitoring posture, the company can proactively address any ergonomic concerns and create a safer work environment through training and support tools.



ENERGY MANAGEMENT

Computer vision is also being used in manufacturing to save energy. By monitoring equipment and identifying any that are not in use, factories can turn off unused equipment and reduce their energy consumption. Here's how it works.

Computer vision can be used to detect when a machine is working incorrectly or needs adjustment. For example, if a manufacturing line is producing products that are not meeting specifications, computer vision can be used to identify the

problem and correct it. This helps reduce waste and improve quality.

Computer vision can also be used to optimize energy usage. By analyzing video footage of factory operations, computer vision can identify areas where machines could be running more efficiently or where lights could be turned off without compromising production quality. This allows manufacturers to save money on their energy bills without sacrificing productivity.

INVENTORY MANAGEMENT

Computer vision can be used to track inventory levels in factories automatically. This information can then be used to optimize production schedules and avoid stockouts.

A great example of this is the monitoring of raw materials. A computer vision system can identify inventory levels or thousands of items at set time intervals or even when activity is noted in that area of a warehouse. Through APIs, this information can be used to trigger notifications or automated replenishments.

Monitoring for wasted or excess inventory during the manufacturing process could also prove valuable for

many factories. With CV able to see production lines in real-time, it can count and create valuable analytics about how many components are being loaded alongside the number of finished goods that are being produced.

And let's not forget about checking inventory quality at any point in the manufacturing process. CV could identify that you're suffering from extensive issues in raw materials or that components are frequently being damaged during particular stages of production. Through alerts, counts, and other analytics, manufacturers can tighten up their inventory saving money and time while ultimately improving quality.

TRANSPORTATION OPTIMIZATION

Computer vision can also be used to optimize transportation operations in factories with powerful results.

Inside the factory and warehouse, transportation optimization could include using CV to ensure that pallets are fully and correctly loaded, aisles are clear to avoid movement delays and that loading equipment is where it should be at all times.

Moving on to the loading dock presents a host of other opportunities. Imagine being able to use existing security cameras to track when trucks arrive, how long they spend at loading docks, how much time is being spent with active loading vs. sitting idle, and more. Particularly in tight loading areas, ensuring that your transportation is running smoothly and efficiently directly impacts the bottom line.

Finally, CV can also be used at a higher level to see and analyze traffic patterns with the goal of spotting bottlenecks and planning more efficient routes.





NEXT STEPS

Clearly, there are a lot of ways to use computer vision to improve your factory. However, it can be tough to know where to start or how to implement such a system.

That's where Kibsi comes in.

At Kibsi, we have created the ultimate computer vision platform for businesses. With incredible built-in logic, libraries, and scenarios, it's easy to point and click your way to a tailored computer vision

solution in minutes instead of months. The best part is that most manufacturers can get started simply by connecting to existing security cameras.

We have a team of experts who can help you assess your needs and find the best solution for your factory. Contact us today and learn more about how we can help you leverage computer vision to improve safety, increase efficiency, and deliver better products.



The Video Intelligence Platform

Our computer vision platform enables businesses of all shapes and sizes to turn their camera feeds into actionable insights.

All you need to start is an IP camera and a question. The Kibsi platform is a flexible, no-code solution for building tailored and custom computer vision applications in minutes not months.

If you're ready to see your business in a whole new way, contact us now!

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