chooch

ROI of Computer Vision

Whitepaper 2022

Executive Summary

As business leaders investigate the transformative Return on Investment (ROI) of computer vision, they are finding strong evidence that this technology can improve virtually every industry it touches.

This explains the rapid growth of the computer vision market, which held an estimated value of $15.9 billion in 2021 and is expected to reach $51.3 billion by 2026. (1)

It may also explain why nearly all respondents in a recent IDG/Insight survey believe that computer vision will boost revenue while saving time and money–and this could also be why 37% of those respondents plan to implement the technology to improve their operations in the near future. (2)

Whether the ROI goals of an organization relate to defect detection, operational efficiency, preventative maintenance, cost reduction, customer satisfaction, security, better healthcare outcomes, or safety–this white paper shows how computer vision is empowering firms across all industries to achieve never-before-possible outcomes.

Table of Contents

The Benefits of Computer Vision Technology

What Is Computer Vision?

In the simplest of terms, computer vision is a technology that allows computers to analyze, interpret, and understand visual information in order to automate tasks and make decisions that normally require human input. As IBM puts it, *"If AI enables computers to think, computer vision enables them to see, observe, and understand."* [3]

Of course, computers do not technically "see" the way humans do. Instead, they derive statistical inferences (or conclusions) from numerical values–values that represent the colors of pixels in a digital image or video stream.

How Does Computer Vision Work?

Just like every person learns to see and understand the world, computer vision algorithms need to be trained to interpret and understand the visual information they capture. Computer vision platforms use deep learning technology to "train" algorithms to derive inferences from visual data and make nuanced decisions based on those inferences.

Training Computer Vision Algorithms

The computer vision training process involves downloading thousands (or millions) of labeled or annotated images. For example, training images for a defect detection system would include annotations to indicate the presence/non-presence of defects and the types of defects involved. After receiving enough examples, the AI algorithm learns to identify these defects in real-time.

With the right training, an AI algorithm can perform a wide range of tasks that would have required visual monitoring, analysis, interpretation–even expert-level decision-making.

Full-Lifecycle Computer Vision Tools

The best computer vision solutions function as full-lifecycle platforms that facilitates the fast and rapid training of new AI algorithms. A full-lifecycle computer vision platform includes tools to automate the process of annotating and tagging training images. Advanced platforms also feature tools to instantly generate synthetic training images, to increase the size of the datasets. This speeds up the process of developing computer vision models for unique and entirely novel scenarios.

Computer vision platforms may now feature no-code interfaces, allowing non-tech savvy users to train sophisticated algorithms without knowing how to code.

Integration with Existing Camera Network

A computer vision platform integrates with a network of high-definition cameras strategically positioned to capture visual information. This could be an existing network of cameras or a new one, depending on the use case. Computer vision algorithms can even receive and interpret live video and images from mobile cameras, such as flying drones and walking robot dogs.

Edge, Cloud, or Self-hosted?

As for hosting, computer vision platforms can run in the cloud, on local edge devices, or self-hosted private cloud instances. Edge devices offer an increased level of security in mission critical, disconnected or hardened environments. Depending on the compute power available, developers can configure an edge-based computer vision system for AI vision model training and inference generation as close to the data as possible. Once integrated with existing IoT sensors and downstream applications, computer vision truly becomes a company's "eyes" in the field.

Overview of Computer Vision Use Cases and ROI

The practical use cases for computer vision are endless, including systems for:

- Detecting vehicle types and license plate IDs
- Facial recognition for patient/customer/employee authentication
- Defect detection for manufacturing
- Personal Protection Equipment (PPE) detection
- Inventory counting, monitoring, and re-ordering
- Support for digital twins in manufacturing
- Warehouse management
- Medical diagnosis
- Site monitoring and loss prevention
- Laboratory analysis and cell counting
- Smoke and fire monitoring and detection
- Security feed monitoring

Ultimately, computer vision eliminates the errors, inefficiencies, and negative outcomes that inevitably happen when workers suffer from boredom or distractions in monotonous visual jobs. These negative outcomes include increased absenteeism, high turnover, errors, injuries, and counterproductive work behavior.[4] Computer vision also saves time and money through its capacity for 24/7 uptime and exponentially faster and more accurate visual task completion.

By freeing up employees to focus on more business-critical tasks, computer vision alleviates labor burdens–even when it comes to high-skilled analyst jobs. This brings the added benefit of decreasing the need for workers to be physically present in every location.

Here is an overview of some of the most compelling computer vision ROIs:

Improved productivity

Speeds up workflows to boost productivity exponentially

Increased accuracy and operational excellence

Results in fewer inspection errors and greater reliability, consistency, accuracy, and operational excellence in task performance

Higher efficiency

Relieves organizations of labor burdens, so they can achieve more with fewer employees

Automation of monotonous tasks

Reduces the negative effects of employees completing tedious and repetitive visual tasks

Easier scaling

Empowers immediate scaling of visual task performance without the need to hire and train additional employees

Stronger staff performance

Improves the ability of human workers to perform their tasks more successfully, efficiently, and productively

Lower labor costs

Dramatically reduces labor costs by performing the same tasks for less money

Improved safety

Reduces the risk of injury and sickness by more efficiently identifying risks such as traffic flow inefficiencies and trip-and- fall dangers, and detecting incidents when they occur

Computer Vision in Action

A leading manufacturer adopted the Chooch AI Vision computer vision platform with three goals in mind – quality assurance, PPE compliance, and digital twin creation.

Initially, the leadership team aimed to reduce the high cost of manufacturing defects, which incurred shipping and replacement costs, as well as product liability lawsuits. Some customers posted photos of defective products on their social media accounts, which damaged their brand reputation. Custom AI Vision models developed by the customer's team with Chooch guidance, instantly detected cracks, dents, painting and packaging errors, and other defects that might evade the human eye.

Next, the team deployed the platform's ability to detect PPE compliance. Their research determined that hand and eye injuries were the leading cause of lost workdays and the driver of high workers' compensation and medical bill costs. AI Vision not only monitored employee compliance with company mandates to wear protective gloves and goggles, but alerted managers whenever it detected a failure. The company saw an immediate reduction in compliance failures and injuries.

AI Vision also assisted with the company's use of digital twins. By using virtual replicas of their products, processes and plants, they could cost-effectively test designs, optimize processes, and analyze workflows on the shop floor. Computer vision sensors captured the data needed to create accurate digital twins, which provided them with real-time insights.

Final Thoughts

Computer vision technology provides high business ROIs across many use cases and industries.

Due to its capacity to achieve countless tasks that require human eyes, human expertise, and human understanding – with greater speed, accuracy, consistency, cost efficiency than humans – this technology is radically transforming the ROI potential of every sector it touches. Now, these rapidly deployable computer vision solutions help businesses achieve exponential improvements in the areas of safety, security, quality assurance, patient outcomes, customer experience, industrial maintenance, and so much more.

At **Chooch**, we work closely with our ecosystem partners and customers to ensure high ROI for each one of their computer vision initiatives. In the years ahead, as more businesses recognize the transformative power of computer vision, we look forward to helping firms across all industries–including manufacturing, energy, logistics, warehousing, retail, healthcare, construction, and other sectors–achieve exceptional outcomes.

If you would like to learn about how computer vision can overcome unique challenges in your industry, contact our team and schedule a demo of the Chooch platform now.

References

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About Chooch

Chooch is a leading AI Vision platform that instantly detects specific visuals, objects, and actions in videos and images, especially critical anomalies, immediately comprehending their significance and launching preprogrammed responses – all in a fraction of the time it takes the human eye to notice an issue.

Chooch services multiple industries – manufacturing, public sector, retail, telco, healthcare and many more across fortune 500 companies with leading partner including Microsoft, Deloitte, Nvidia, EY and HPE.

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