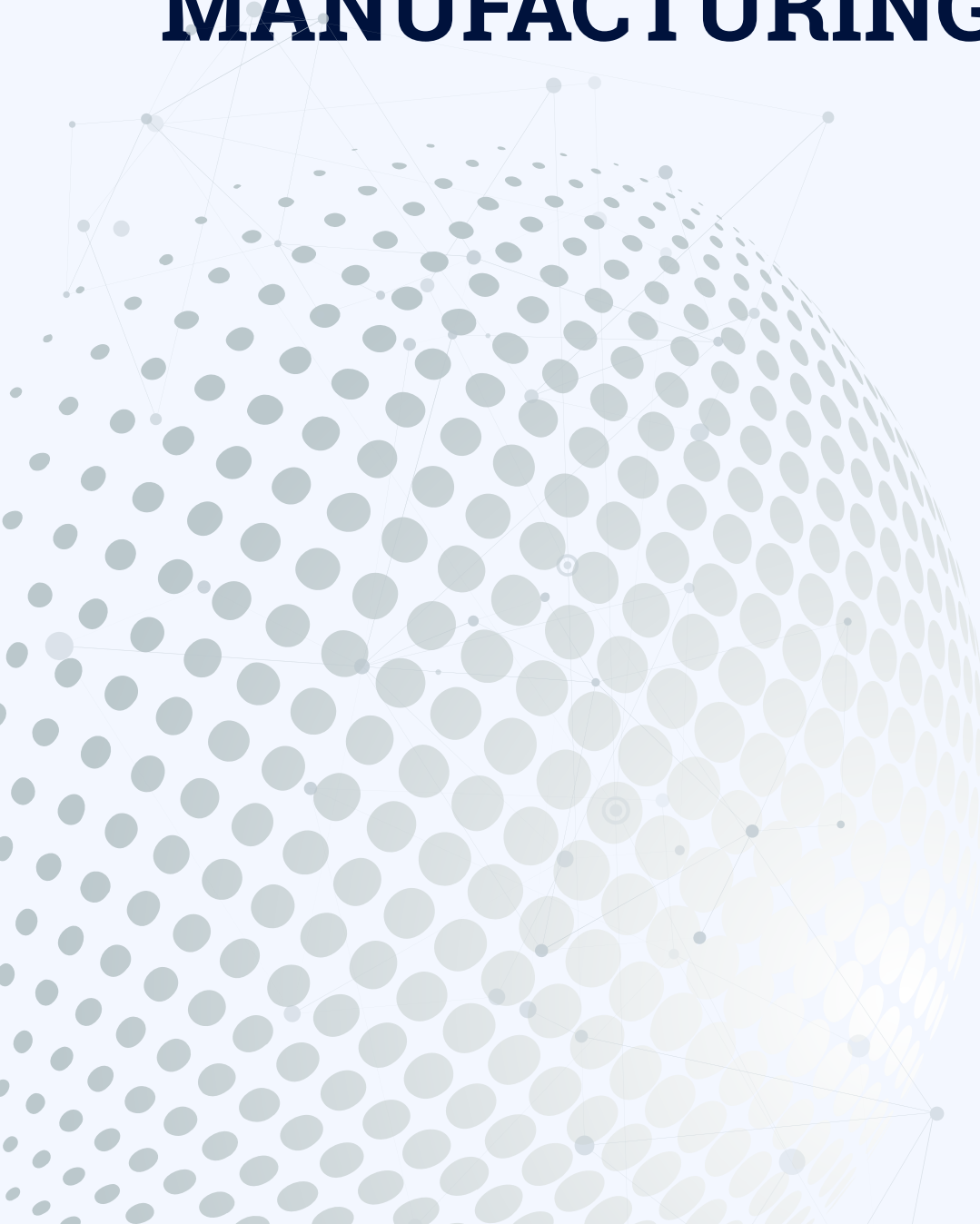


AI Usecase

VISUAL INSPECTION WITH AI IN MANUFACTURING



Visual Inspection with AI in Manufacturing

The manufacturing industry is one of the most complex but it's also being challenged to be more efficient to produce higher quality products than ever before. One way manufacturers are doing that is through visual inspection. A visual inspection is a process that involves a human being looking at a product or process to identify potential problems and improve the quality of the product. This method is cost-effective and relies on the human senses to detect defects.



Challenges

Human-led or manual or traditional visual inspection poses the following high-level challenges:

- **Inefficient** - Because visual inspection is so reliant on human employees, it can be quite inefficient. Employees might not be paying attention all the time, or might not have the best angle to see a particular issue.

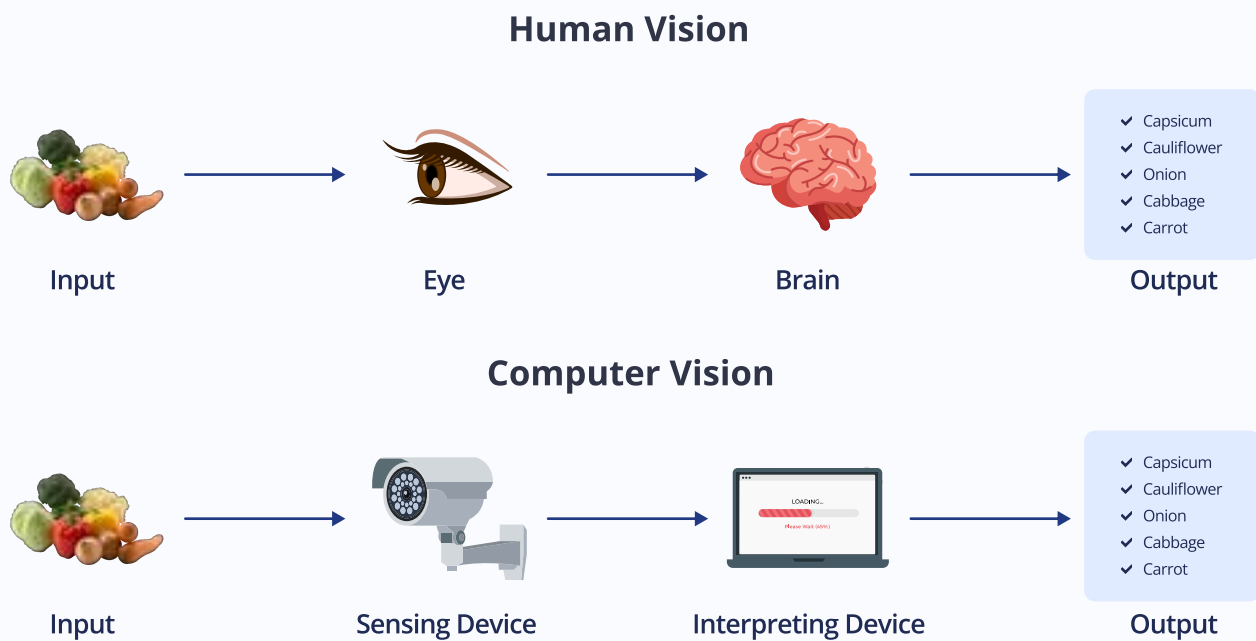
- **Inconsistent** - Different employees will likely have different standards for what they consider to be an issue that needs to be fixed. This can lead to inconsistency in the quality of the product.
- **Time-consuming** - Visual inspection can be quite time-consuming, particularly if many products need to be inspected.
- **Error-prone** - Human employees are not perfect and can make mistakes. This can lead to issues with the quality of the product.

Solutions

New developments in artificial intelligence allow manufacturers to automate the process of inspecting their products without the need for manual labor. With the help of pre-trained AI tools, they can recognize defects in a variety of backgrounds and quickly respond to them. This significantly minimizes the need for skilled visual inspectors and helps meet the demand for quality assurance in the industry.

- **Machine learning** - Quality control systems in smart manufacturing can be improved by leveraging machine learning. Reinforcement learning algorithms can help automate the process between company employees and collaborative robots. This provides for intelligent inspection and corrective actions of an intelligent system, which can be tailored according to the parts being inspected. The use of advanced ML models can help to decrease the cost associated with manual inspections as well as the amount of time needed before production can begin. These models work by creating predictions based on data collected and analyzed. This process generally results in a lower number of items that require inspection, providing monetary benefits. Some recent advances in machine learning for industrial applications include a wide variety of techniques and algorithms. These advances have been focused on process control, quality control, raw materials classification, and chemical properties improvements.

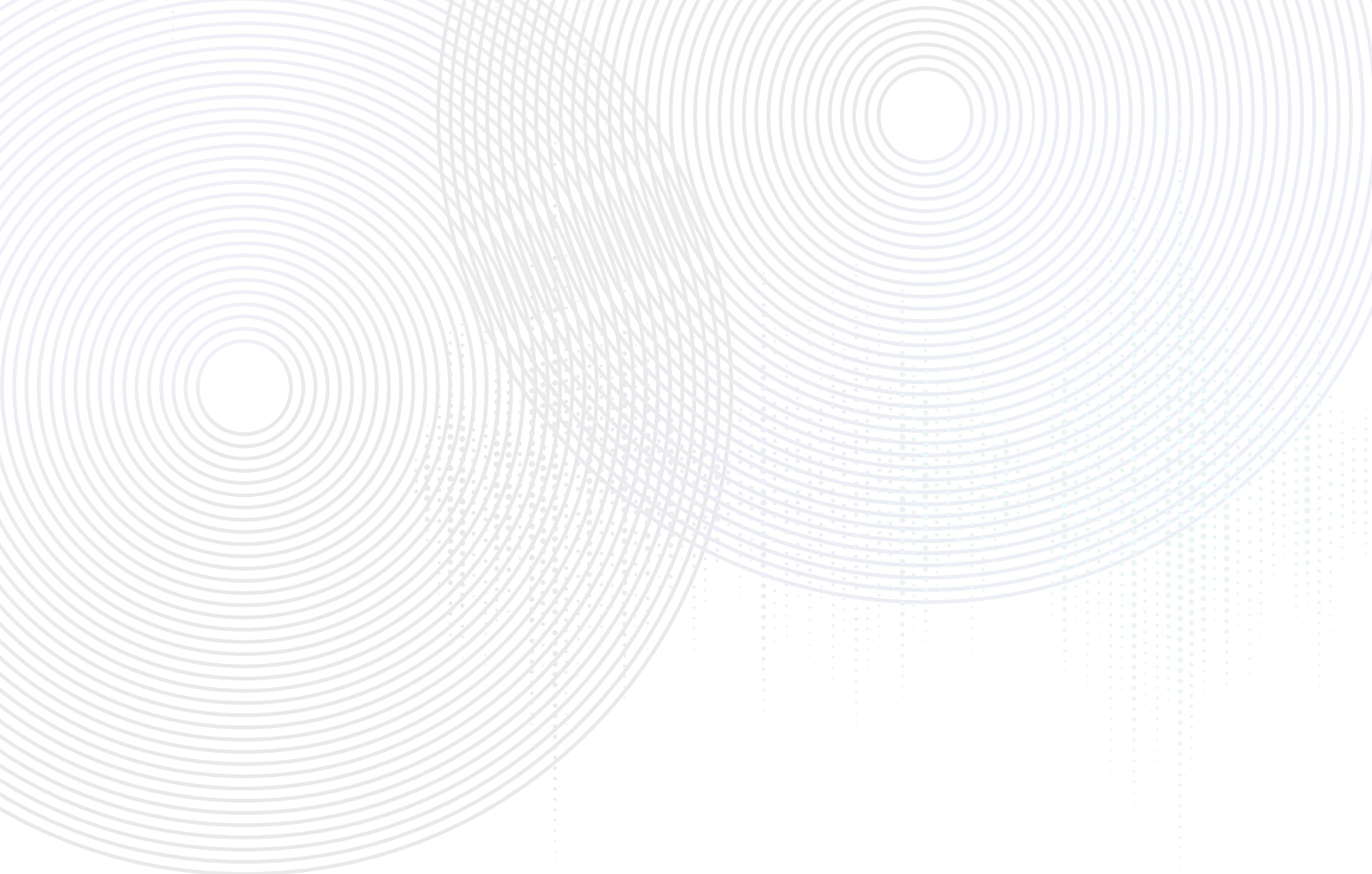
- **Machine vision** - Machine vision has many advantages over human vision when it comes to measuring and analyzing a structured scene. Machine vision can quickly and accurately identify details that are too small for the human eye to see, and do so with greater reliability and less error. Machine vision is superior to human vision in terms of speed, accuracy, and repeatability when measuring and assessing a structured scene. A machine vision system can rapidly and repeatedly inspect hundreds or thousands of parts per minute, far exceeding the inspection capabilities of human beings.



- **Industrial IoT (IIoT)** - IIoT enables automation and remote monitoring to improve productivity and efficiency. Alerts can be sent in real-time to allow for rapid response to issues. Video connectivity through IIoT devices supports automated visual inspection using AI to detect and remove defectives from the assembly line. IIoT provides significant advantages for quality assurance monitoring within the manufacturing process.

Artificial intelligence has made it easy to develop systems that can surpass the level of human precision in visual inspection. As the AI system evolves, it can also incorporate the capabilities of human assessment. If you are looking to build and deploy a customized visual inspection solution powered by AI, contact [Devfi](#) today.





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