

# Pipe Loading Verification - Inhouse Developed AI & ML Solution

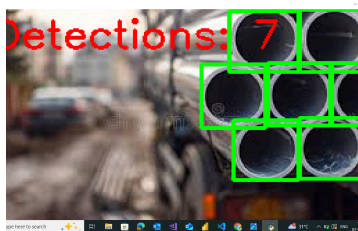
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## Background

In the manufacturing and dispatch operations of pipes, trailers are loaded with pipes stacked in socket-spigot combinations. Each trailer typically carries 96 or more pipes across two layers. Due to varying pipe lengths and diameters (ranging from 80 to 1200 with ~19 SKUs), manual counting becomes challenging—especially for shorter pipes on the top layer, which are often hard to see from the ground.

Currently, a three-stage manual verification process is followed by the loading, dispatch, and security teams. However, this system is time-consuming, labour-intensive, and still prone to rare errors (~1%), especially under low visibility conditions like night shifts. Additionally, close human involvement around heavy trailers poses safety concerns.

## Pipe Loading Verification Automation – Inhouse Developed AI Solution for Safer & Error-Free Dispatch



We have developed an AI-based image vision solution capable of counting pipes from a static image taken at the time of trailer loading. As the loaded trailer arrives at the verification point, the system captures an image and uses an in-house trained algorithm to count the number of visible pipes in real-time. The solution provides instant output, enabling validation before dispatch.

*(Picture from Inhouse development - Pipe dimension measurement and counting).*

## Key Features and Benefits

- **Automated Pipe Counting:** Utilizes image processing to detect and count pipes.
- **Real-Time Image Capture:** Takes static snapshots as the trailer is loaded, confirming the total count.
- **Night Shift Ready:** Optimized for night shift with proper-light image input.
- **Integration with Existing Systems:** Seamlessly integrates with control systems.
- **Safe & Contactless Operational Efficiency:** Reduces manual intervention, saves time.

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