

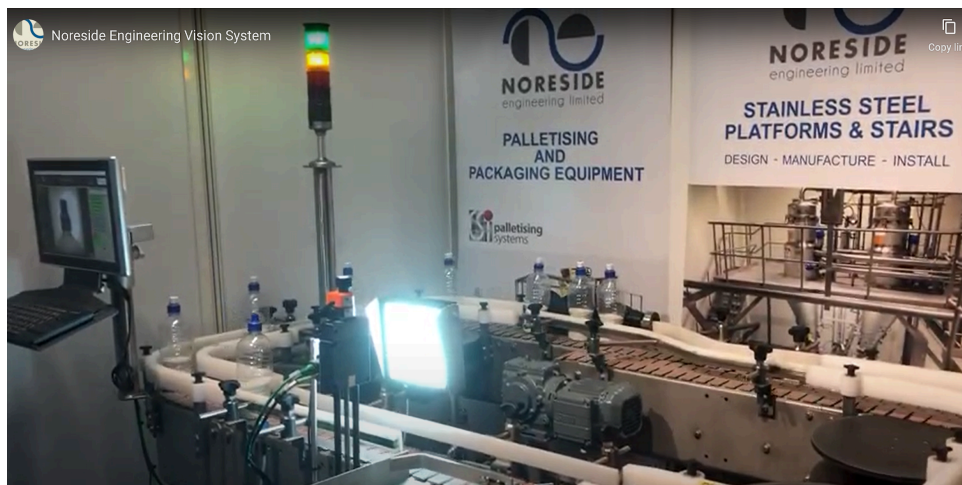
By Ashish Uttarwar

Sports Cap Inspection - Machine Vision

A sports cap on a bottle consists of multiple components and is crucial for multiple purposes. It provides easy opening, easy closing of the snout and tamper evident sealing. When closed, it ensures that the cap is leak proof. Any absent or misplaced component can result in potential damage due to hazard or due to leakage or contamination. The software was developed to inspect and pass good bottles and reject any bottles with defects/missing components.

Farelii Machine Vision, Ireland

Farelii Machine Vision builds vision inspection solutions customized to end user requirements. They have extensive hands on experience of working in production lines for the pharmaceutical industry. They are familiar with compliance requirements of the pharmaceutical industry and thus make sure that the vision inspection solutions comply with those.



Automatic Sports Cap Inspection System display at an expo by Noreside Engineering
Noreside built the conveyor/transport system, auger and reject station. [Link to the setup video](#)



Industry

Pharmaceutical/Food

ARAV Systems provides software consultancy and development services particularly using NI hardware and software products.

Testimonial

"Farelii Machine Vision would highly recommend ARAV Systems Pvt. Ltd for developing software. I worked with the team to develop a user friendly vision system software package to detect defects on sports caps on water bottles. Sports caps have many different components which are transparent in colour and quite small to detect. The in-depth software knowledge of the ARAV systems engineering team helped overcome the challenges required to automate the inspection routines to provide a consistent reliable inspection image for the vision software to make the decisions on pass/fails components. I found the team to be enthusiastic and honest giving advice throughout project phases. The project objective was delivered to build a software package to support an automated vision inspection development project."

Technical Director & Owner



Objective

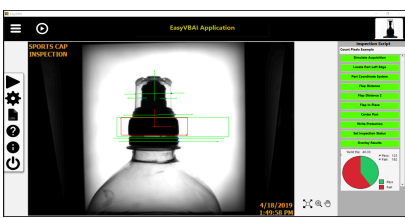
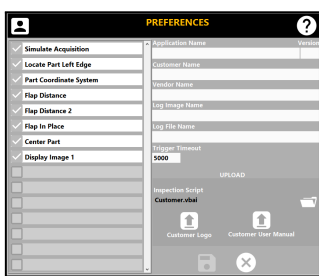
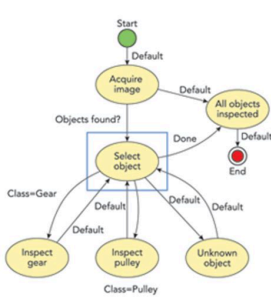
Develop a configurable software platform that will focus on image processing algorithms and integration with other subsystems. The software should display live statistics of the inspection results and allow for users to review past results. This will help make immediate corrections on the production line and thus minimise production loss. Images of the defects are also useful when providing information to the component suppliers.

Challenge

Sports Cap consists of multiple components fitted closely that allows for leak proof, reliable and convenient mechanism for the user to open and close the bottle cap. Some components are transparent and are covering other components. The bottles are always moving and the inspection has to be performed on the moving bottles. The components can cause glare and not allow for inspection of internal components. The system has to be able to integrate with industry standard instrumentation based on the customer requirements.

Approach

Utilise standard software tools for image processing and integration. Develop a user friendly interface that integrates with the image processing at the backend. For that, we used NI Vision Builder AI. It offers a configurable environment for developing image processing algorithms. At the same time, it also offers integration capabilities to connect to any industry standard hardware like Barcode Scanner, PLC etc. All vision electrical components, sensors, power supplies, timers, UPS etc. were installed into a CE Marked electrical panel.

		
Friendly User Interface	Configurable Criteria	State Diagram
		



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