

Industries

Nantech provides solutions that can be customized and adapted to suit most industries. A broad list of the relevant industries and the areas of possible application of Machine Vision technology is highlighted below.

Automotive

Dimensional Measurement
Profile Verification
Surface Inspection of Components for dents, blowholes, scratches
Verification of subassemblies
Process Control
Optical Character Recognition



Pharmaceutical

Blister Pack Verification
Batch/Lot/Date Code Verification
Bar Code and Data Matrix Code Reading
Inspection for Contamination
Colour Inspection
Cap Closure and Alignment



Food and Beverage

Price and Date Code Verification
Optical Character Recognition
Colour Grading
Seal Integrity and Inspection
Inspection of containers for blow holes, dents, scratches and improper projects



Electronics

SMD Verification
Presence and Absence Verification
Label Alignment Inspection
Solder Inspection
Process Control
Inspection of containers for proper closing, label and batch verification



Packaging

Inspection of proper closing of packages
Volume identification
Label / barcode / datamatrix reading



Special Applications

Integration with pick and place robot
Interior Inspection using telecentric lens for small objects
Surface Inspection for defects of small components
Cylindrical object inspection with telecentric lens
3D object measurement using structured lighting technique
Automatic adaptation of new model for inspection



Projects

Completed

Brake Piston Cylinder Inspection(Multivariants)
Spline Gear Inspection(Multivariants)
Fly Wheel Inspection(Multivariants)
Bar Code Reading
3G Box Inspection
Needle Inspection

Under Development

Brake System Component Dimension Measurement
Cage Sleeve Comprehensive Inspection

Consultancy

Provided consultancy solutions to more than 40 companies

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About Nantech India Private Ltd.

An emerging, dynamic enterprise, Nantech provides groundbreaking technology that accentuates the importance of effective quality inspection and process control in the entire manufacturing sector. Within the short span of one year, Nantech boasts of a star studded portfolio of clients ranging across the sectors of automobiles, pharmaceuticals, electronics, consumer goods etc. Nantech has provided consultancy to over 30 single tier automotive companies and installed MV application in a number of other sectors.

Nantech Resources

Equipped with a state of the art laboratory, Nantech develops customized machine vision solutions and applications, exclusively designed for each client. This is achieved through a comprehensive and detailed study of the product, manufacturing process and assemblage at the client's factory. Our team identifies the areas of quality control and locations for machine vision applications in the factory, based on which we provide our solutions.

Experienced professionals, in-depth technical competence and advanced infrastructural facilities enable us, at Nantech, to provide unparalleled solutions which ensure that the superior quality of your products is never compromised. Our laboratories are equipped with industrial cameras, right from the board level to operating system based smart cameras. Special purpose lighting and lens systems, different software libraries further add strength in developing comprehensive and customized Machine Vision Solutions for our clients.

All our resources work in perfect synchronization and are designed to seamlessly mould into your production cycle, keeping an eagle's eye on the quality of every product that is created in your factory.



The Nantech Process

The first step towards providing our clients a near flawless quality control mechanism commences with a detailed study of the manufacturing process. Subsequently, a discussion with the production and quality head is held, wherein locations for machine vision solutions are identified. Our team then designs the vision system, develop images and the proof of concept. The application is then fine tuned to perfection, with inputs from the production heads. Once the application is accepted, it is implemented in the factory. There are provisions to also integrate the application with existing SPP, or remotely monitor the performance and provide correction.

Nantech also provides customized solutions in system automation. Our team works alongside the system integrators and special purpose machine builders, in providing consultancy and Machine Vision solutions to our clients. Our advanced technical know-how in machine vision enables us to take responsibility and ownership to even those projects where third party Machine Builders manage and supply vision as part of a bigger solution to their global customer.

Services

Design and Development

Right from assessing the client's requirement, to developing the final application, our expert engineers offer their undivided focus and dedication to every project.

Installation and Commissioning

Once the application is developed, our engineers are present until the installation and commissioning of our systems are in perfect functioning in the client's factory.

Software

Software development is the core of all our machine vision inspection systems, and we have rich experience in supplying and coding software. Software is developed at two levels: Application level and Operator/User level.

Manufacturer and Assembly Test

Once deployed, the system is then subject to a variety of scenarios, which further validate the functionality of the application. If any changes are in order, our engineers complete them on site and deliver a fully functional application to the client.

Training

Our service at Nantech does not end with setting up the application at the client's factory; we offer Standard, Application or Custom training at different levels, as required by the client.



MACHINE VISION

MVS is the result of merging one or more sensing techniques and computer technologies. The computer extracts data from the image, compares the data with previously developed standards and presents the results as an response output. A simple functional diagram is shown here:



At present quality inspection of manufactured objects are based on human observation. In case an objects has ten parameters, mostly 5 – 10 individuals are employed to undertake inspection. If the object is critical, sometimes the inspection is duplicated to ensure 100% accuracy before being dispatched to customer.

However, human vision based quality control has following drawbacks:

- ❖ People have limited attention span
- ❖ Susceptible to distractions
- ❖ Inconsistencies are there from person to person, shift to shift etc.
- ❖ The vision and sensitivities of every person's eyes may vary

MACHINE VISION ACTIVITIES include: Image formation, acquisition, image processing, analysis and decision making.

MACHINE VISION BENEFITS AND JUSTIFICATION

"Justification need not be based solely on labour displacements. Machine vision should be considered wherever the prevention of failure or the reduction of the cost of failure is a priority."



QUALITY AND PEOPLE MOTIVATIONS

- ❖ Conducting 100% inspection versus sample inspection
- ❖ Avoid errors due to operator judgment, operator fatigue, operator inattentiveness, and operator oversight
- ❖ Avoid Labour turnover and training cost
- ❖ Remove from hazardous, unhealthy environment
- ❖ People are only 70-85% effective, especially when dealing with repetitive tasks

ECONOMIC MOTIVATIONS

- ❖ Detecting reject state at point of lowest value added
- ❖ Providing early warning to detect incipient reject state to reduce scrap

MACHINE VISION - A DATA ACQUISITION SYSTEM

- ❖ By recording the product data automatically from vision system, one can monitor output quality and identify location, type of errors and can initiate preventive action

MISCELLANEOUS MOTIVATIONS

- ❖ Substitute capital for labour in expansion mode
- ❖ Automate record keeping and capture statistics quicker
- ❖ The cost of failure is much more difficult to quantify and includes internal failures resulting in material scrap and rework, external work resulting in warranty claims, liability and recall orders as well as the hidden costs such as loss of customer
- ❖ A machine vision system can spot trends – trends that will lead to material scrap

MACHINE VISION TECHNOLOGY - CURRENT STATUS

- ❖ High resolution cameras (38 mega pixels) area & line scan cameras
- ❖ Different lighting systems CCD, CMOS sensors
- ❖ Mature optical systems to take care of varying requirement
- ❖ Development of general purpose / specific purpose software
- ❖ Integration with process control and quality control automation systems using PLC & HMIs
- ❖ Development of high speed interface - HS link, Camera Link, Giga bit Ethernet



Project 1 - pharmaceutical



Inspection of Blood transfusion needles

Needle Tip Inspection for Inward and Outward bend
The needles that are assembled in an indexing table are to be inspected for the following defects:

- ❖ Inward Bend
- ❖ Outward Bend
- ❖ Blunt tip

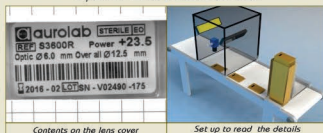
Two cameras placed 80mm apart with back lighting were used for the same.

Project 2:

Brief description

Contact lenses are packaged in a plastic container, with their corresponding details printed on a sheet and pasted on the containers. This is then put inside a card board packet. The need was to read the details of the cataract lens and print the same details and paste it on the top cover.

Inspection of Barcode On Contact Lens Packet



Contents on the lens cover

Set up to read the details

ELECTRONICS PROJECT

Project 3

Modular conveyor set up for inspection



Inspection Parameters

- A. Front Side**
 - ❖ Presence and absence of connectors
 - ❖ Presence and alignment of bar code
- B. Back side**
 - ❖ Presence / absence of fan.
 - ❖ Presence / absence of Warning Label.
 - ❖ Presence / absence of Barcodes.



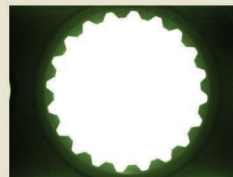
AUTOMOTIVE PROJECTS

Project 4 - Inspection of Spline Gear



Brief description:

Spline Gear is a machined product and is used extensively in automotive engineering. This company produces over 13 variants of this product. As the items are machined, there are chances of the same item being machined twice, leading to double broaching, which is a fault.



One time broached component - OK



Two times broached component - Not OK

Project 5 - Inspection of fly wheel



Brief description:

Flywheel is an automotive component used in all vehicles. A Korean company manufactures this component and supplies the same to Hyundai Motors. A hot geared wheel is placed on the flywheel and it is pressed by a 70 ton hydraulic press.



with Chamfer



without Chamfer



Fly wheel