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Sensor Intelligence.

Bottling Quality - Applying Vision Sensors to the Wine Industry

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Bottling Quality - Vision Sensors in the Wine Industry

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- Machine vision
- Smart cameras
- What has this got to do with wine?
- The drivers of the wine market in Australia
- Vision sensors
- Is there a place for a vision system in your production process?

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Machine Vision

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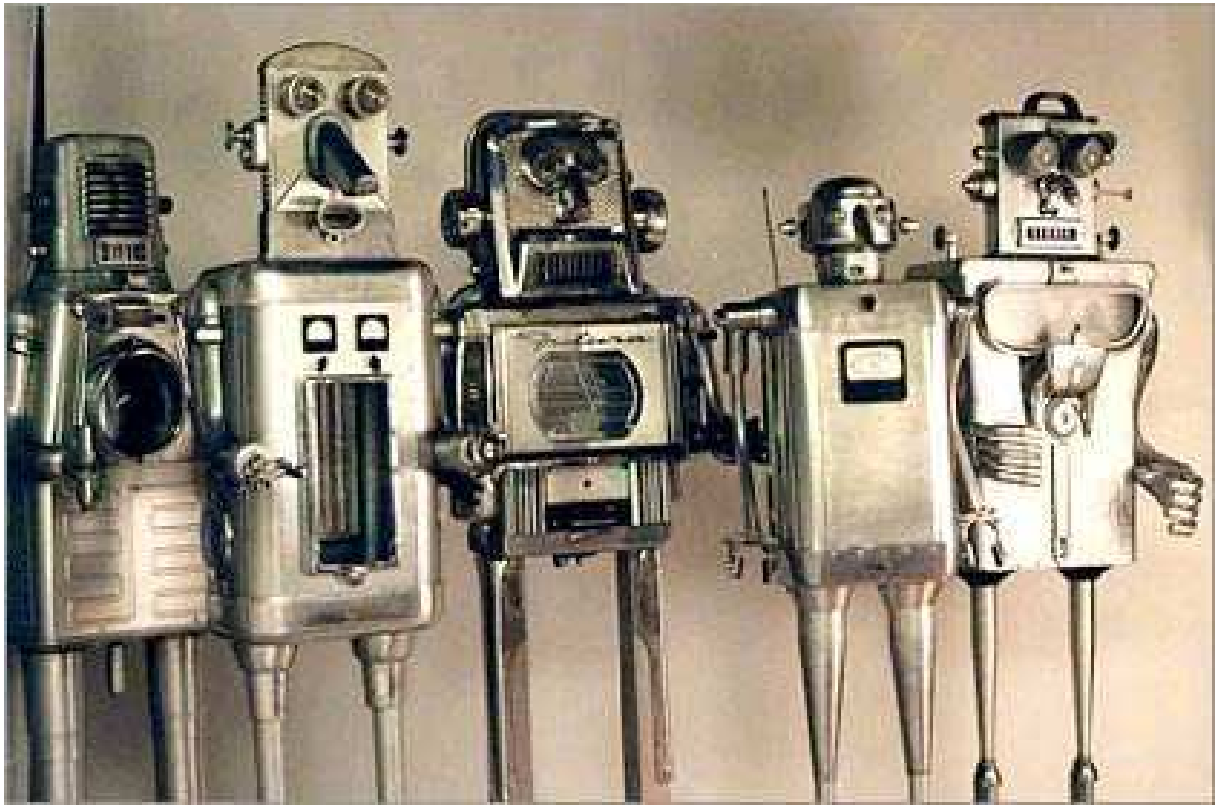
- So what is machine vision?



- It is not, as this picture suggests, Robby the Robot standing beside a production line

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Machine Vision

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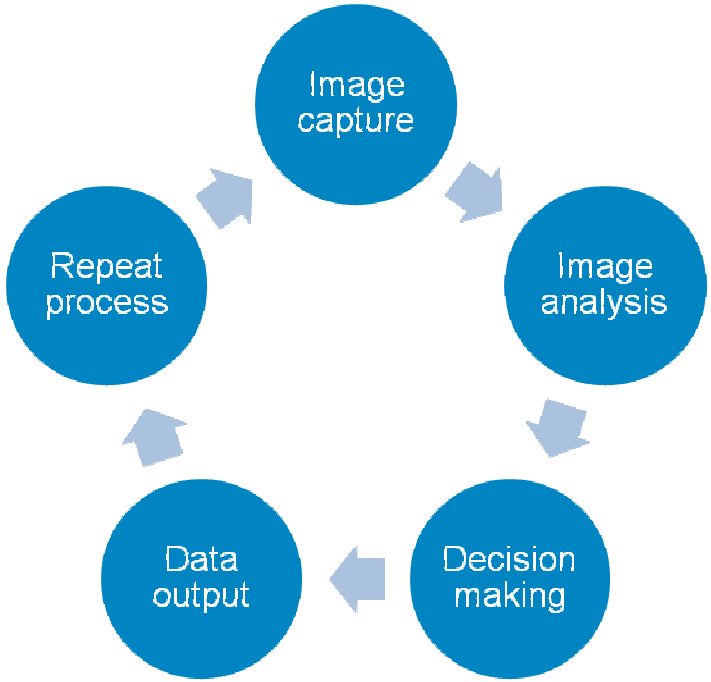
- Uses cameras in the context of process control
- Is generally defined as the analysis of images and extraction of data for controlling an automated process or action



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Machine Vision

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- Machine vision has come a long way in the last thirty years

- Early developers of equipment realised that almost any material handling or logistic process that involved object inspection would suit a vision system

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Smart Cameras

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- Machine vision suppliers then developed machine vision systems into “smart cameras”
- Possess image capture capability
- Are able to extract information from captured images
- Make decisions that are used in wider machine automation systems
- Typical applications now include
  - detection of faults and flaws
  - non contact measurement
  - part sorting
  - code reading
  - continuous flow dimensional gauging
  - position detection and rotation

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What Has This Got To Do With Wine?

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- What does it have to do with wine?

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What Has This Got To Do With Wine?

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- Industries where vision applications are commonly used are
  - automotive
  - electronics
  - logistics
  - manufacturing
  - packaging
  - pharmaceuticals
  - steel and wood
  - food and beverage
- In the food beverage and packaging industries uptake has been particularly rapid

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Wine Market Drivers

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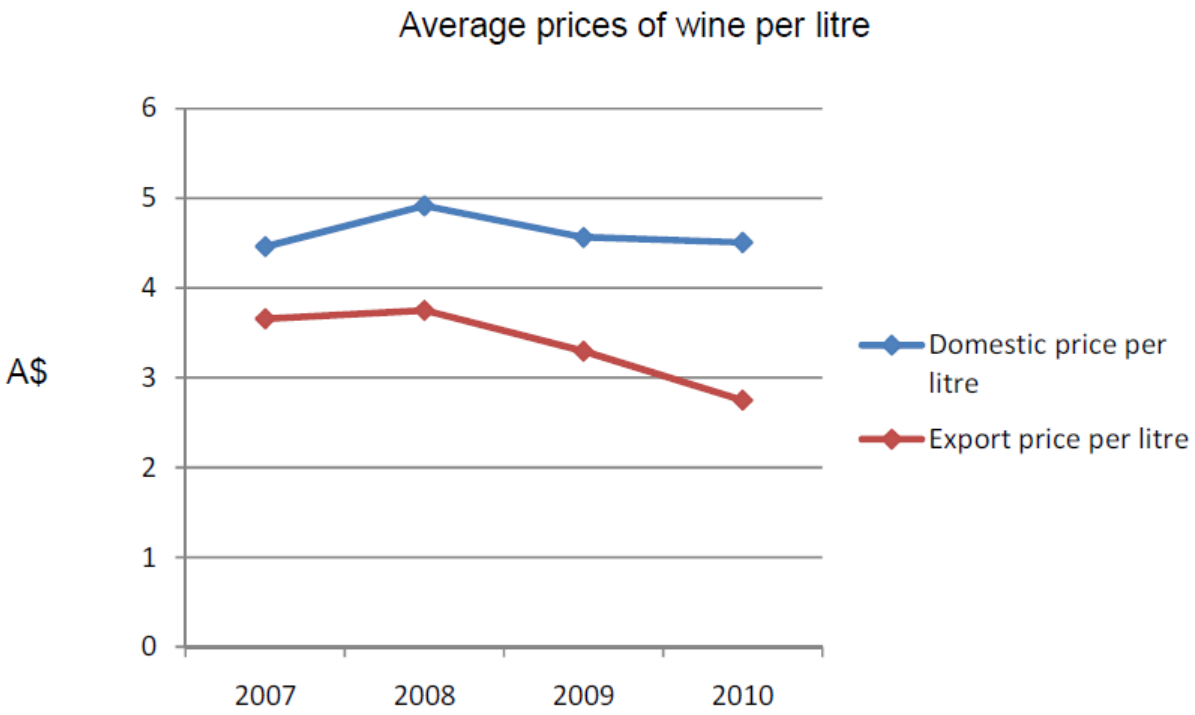
- Domestic sales have increased only slightly from 449.2 million litres in 2007 to 470.8 million litres in 2010
- Export sales now account for 62% of sales in 2010, or 788.5 million litres
- Unfortunately the average price per litre of export wine has dropped from around $3.75/litre to $2.75/litre since 2007



- The rising dollar has been the main cause and export earnings have diminished rapidly

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Wine Market Drivers

- Sales to China appear to be growing steadily
- Chinese consumption of Australian wine jumped 36% to 55 million litres in 2010
- Australian wines tend to sit around the 200 to 400 yuan ($30 to $60) mid to high end mark

- The rising dollar has had little impact on sales of fine wines and established brands in China, but it has affected sales of bulk and commodity wines

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Wine Market Drivers

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- Drivers are constant
- Major growing market is facing downwards price pressure
- Other markets face reduced margins
- Ensure you have world's best practice in your production facilities
- Make the most out of every process available to reduce costs and increase profitability
- Supply quality product with minimum wastage and maximum reliability
- This is where machine vision is ideal

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Vision Sensors

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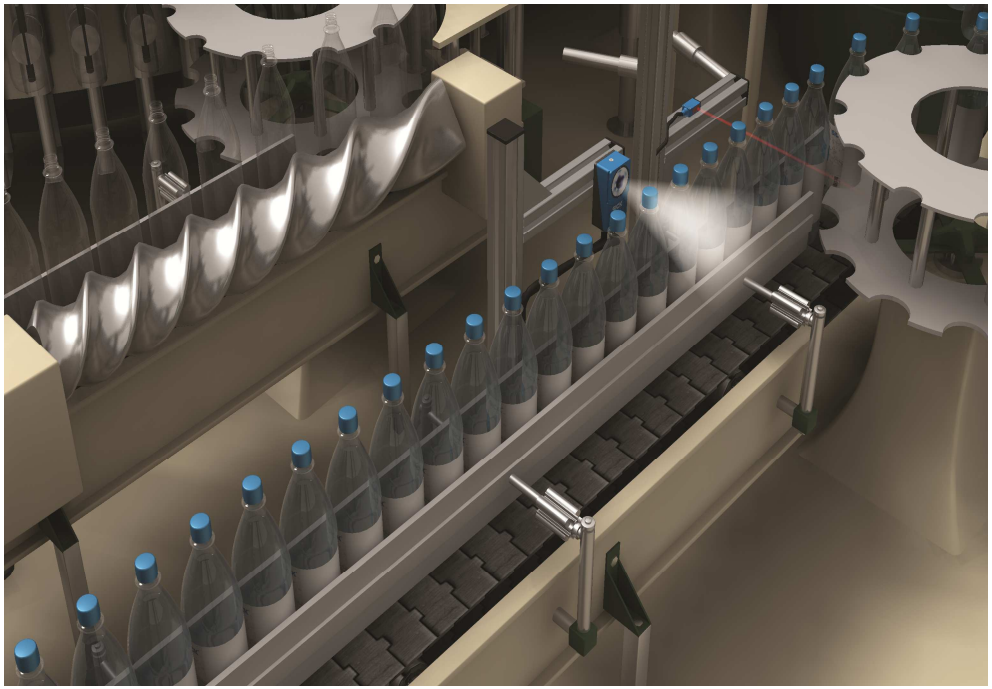
- Fast
  - 5000 inspections per minute

- Accurate
  - Down to hundredths of a millimetre



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Vision Sensors

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- Reliable
  - Keep working all day
  - Never complain
  - Never take sickies

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Vision Sensors

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- Smart cameras remain expensive
- Users had no other choice - until recently
- Vision system suppliers have developed cost effective and user friendly 2D vision systems – now commonly known as vision sensors
- Economical
- High performance
- Flexible
- Compact
- Practical
- Reliable
- Integrated

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Vision Sensors

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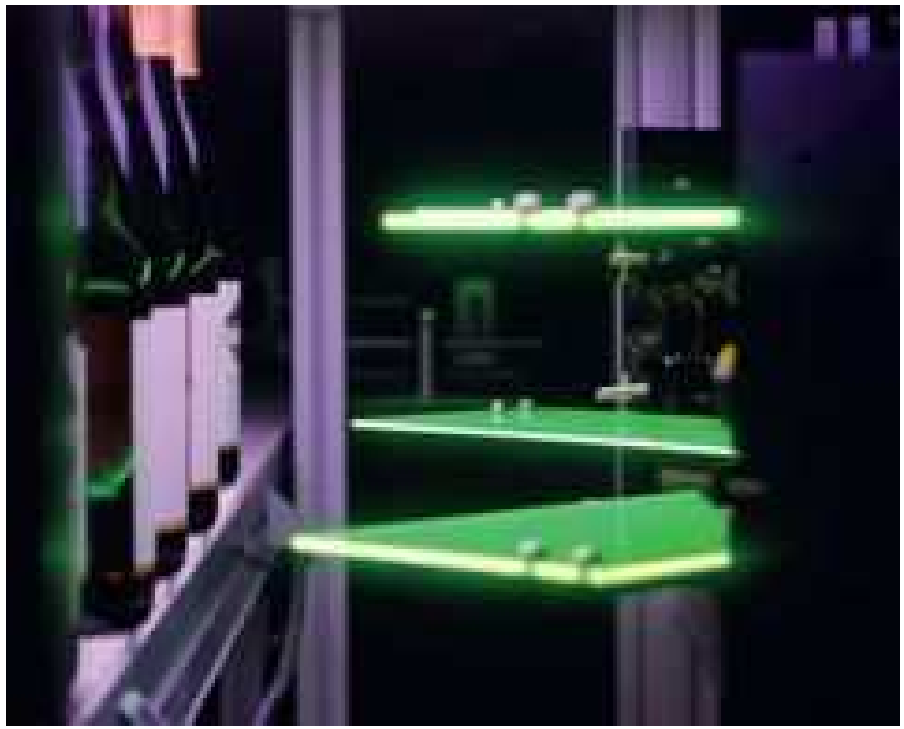
- Robust design
- Fast evaluation algorithms
- High resolution VGA imaging
- High image quality
- High accuracy



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Vision Sensors

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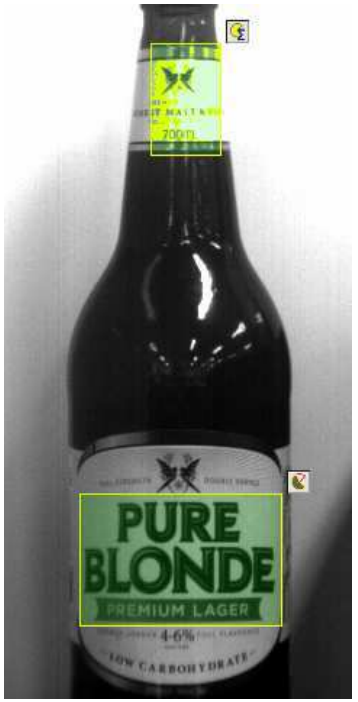
- Control from a desktop PC
- Straightforward
- Easy to use

FAIL

FAIL

PASS



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Vision Sensors

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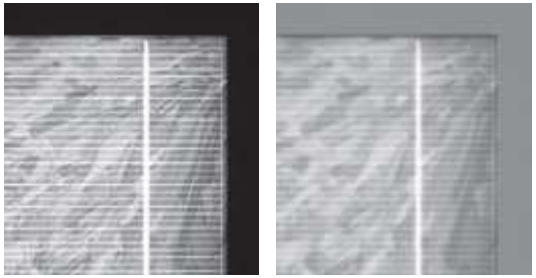
- Easy lens exchange
- Built-in illumination
- Red, green, blue, infrared, ultraviolet, or diffused white light
- Fine tuning and testing

Image with colour camera vs. grey image using white illumination

Image of luminescent marking highlighted by UV illumination vs. image using standard light

Detection of cracked silicon wafer edges using high UV absorption vs. image using standard light



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Is There a Place for a Vision System in Your Production?

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- A simple solution that works is a preferable solution
- What outcome is required?
- Is vision needed to do the job?
- Is the application solvable?
- Which technology should be used?
- What does a typical vision project look like?
- What problems will be encountered along the way?
- If vision is indeed the answer then proof of concept is easy

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Is There a Place for a Vision System in Your Production?

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- You want to bottle quality
- A vision system equals quality
- Can you afford not to have a vision system?

Thank you for your attention.

Questions?