

# Industrial Machine Vision

## No-fee Advice

Offered by a retired academic



### Who Am I?

Emeritus Professor Bruce Batchelor,  
BSc, PhD, DSc, CEng, CITP, FIET, FBCS, FSPIE, FSME, FRSA.

### Formerly

Professor, School of Engineering, Cardiff University, UK  
Professor, Department of Computer Science, Cardiff University, UK  
Visiting Professor, Dublin City University  
Consultant, 3M Company, USA, France, UK

- I am a retired professor of Systems Engineering, with over 45 years of experience, developing Machine Vision systems for industrial applications.
- I have published over 250 research articles and written/edited 9 books, including the comprehensive and authoritative *Machine Vision Handbook* (Springer-Verlag, ISBN: 9781849961684).
- I have acted as a consultant on Machine Vision for numerous companies in UK and USA .
- I have been the chair/co-chair of 12 major conferences on Machine Vision
- I am totally independent; I have no contractual, or other formal links, to companies or universities.

### Skills

- Machine Vision System, overall design
- Selecting a suitable lighting-viewing technique
- Vision-algorithm design, using an interactive image processing system that I have developed over more than four decades.



## What Do I Offer?

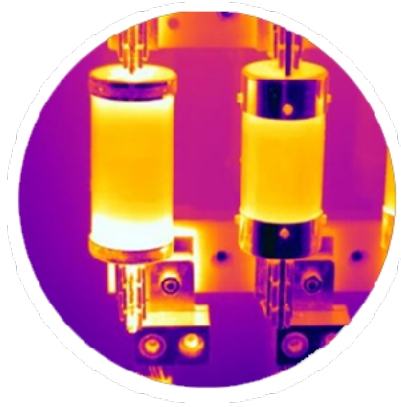
I hope to pass on my experience by:

- Assisting UK, European and Commonwealth industries in adopting Machine Vision technology by demonstrating proof of concept.
- Providing support, encouragement and guidance to academic colleagues developing Machine Vision technology for industrial applications
- Defining outline solutions for automated visual inspection, analysis and control applications.

I offer a “broad brush” understanding of the overall structure of a vision system that could meet the client’s requirements. This is an educational exercise; I do not promise to supply robust, reliable, “polished” software or hardware ready to be installed immediately as part a factory system.

## Why Am I Doing This?

- Post-retirement extension of my life-long employment in research.
- Fun! I have always enjoyed learning about manufacturing processes and practices.
- Intellectual challenge of finding solutions to problems that bring a significant financial, safety, health, social or environmental benefit.
- Satisfaction of helping industry to adopt a technology that can be mystifying to new-comers.
- Supporting a [charitable cause](#) that, for personal reasons, is dear to my heart.



## How Do We Work Together?

The following is a typical scenario that I have encountered many times in the past and relates specifically to product inspection. It would, of course, be adjusted as appropriate for other vision tasks.

- The client sends me samples and/or photographs of the product that is causing concern. Samples “*Good*” product and a large collection of “*Defective*” items are needed.
- The client will be asked to complete a standard questionnaire so that I can understand the manufacturing process, working environment, nature and origin of the product defects.
- It may be necessary for me to visit the factory.
- I experiment with lighting and viewing conditions, to obtain a good quality image of the product.
- Together, we capture a representative sample of digital images.
- I experiment with an interactive image processing system to find how the defective items can be detected/measured from those images
- I report to the client what lighting-viewing and image-processing operations are appropriate.

My intention is to give the client basic knowledge about automated visual inspection and give confidence for commissioning a machine vision system.



## **Working With Universities & Colleges**

I will not provide any assistance, advice, programs, illustrations, or other material to taught-course (Bachelor and Master degree) students. (This is intended to maintain the integrity of assessment procedures.) I will supply appropriate material to teaching staff.

I will assist a PhD student subject provided he/she has gained written permission of his/her supervisor. (I respect the student-supervisor relationship and will maintain the integrity of scholarship.)

I will cooperate with an educational institution that suspects plagiarism of my work.

## **Payment/Reward**

I will not accept any payment, financial, or other reward for my participation in a project.

Instead, I ask the client to make a donation to the charity of my choice. (See below.)

## **Expenses**

I expect the client to cover any reasonable travel and hospitality expenses incurred by me during the course of a project.

I will expect the client to supply any equipment or materials needed for a project.



## Confidentiality

I am happy to sign a non-disclosure agreement in respect of relevant aspects of the client's business.

While I hope to publish novel software, algorithms, heuristics, protocols, developed during a project, I will only do so with the client's consent.

## Disclaimer

In no event shall I be liable for any direct, indirect, incidental, special, exemplary, or consequential injury, loss or damage arising in any way out of a project, a conversation or correspondence relating to it, however it arises.

## Please note

I will not work on projects

In the military or security sectors

Face Recognition and similar applications

That jeopardise peace or freedom; or limit thought or speech

That promote violence or hatred

## Contact Details

Name: Professor Bruce Batchelor

Location: Wales. Good road/rail links to London & Midlands

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## Free e-book

Title: *"Machines Can See .... but not as we do"*.

A gentle introduction to image processing for Machine Vision, with lots of practical applications

Down-loadable from [machinevisionresources.com](http://machinevisionresources.com)

## Donations

Please make donations to

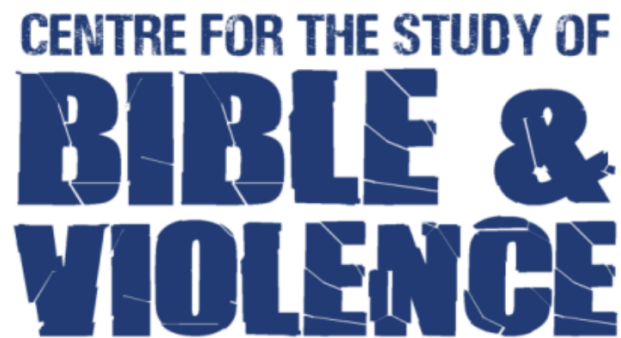
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*I have a family link to the Director of this charity.  
In addition, a dear friend suffered religious persecution in her home country.*