# The Video Gauge – a new approach to meeting the measurement needs of engineers and scientists.

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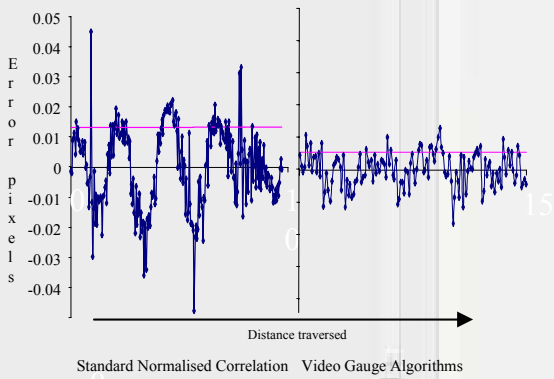
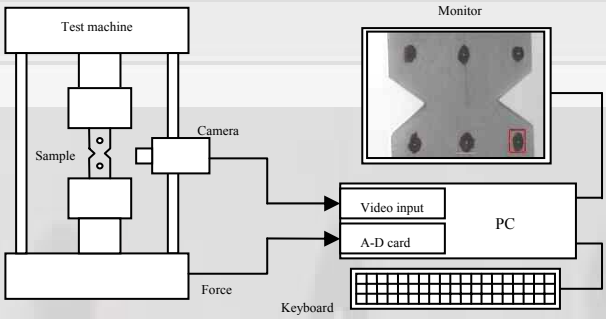
## Basic Principle of the Video Gauge

**The basic principle of the Video Gauge is that of pattern matching via normalised correlation algorithms. That is to say that a target is identified within a video frame and a measurement point is ascribed to that target. The target could be a mark added to the structure being investigated or could be a natural feature of that structure. For example the hairs on a locust wing have been used as targets, as have the bolt heads on a large structure. In subsequent video frames the image is scanned for patterns that match those of the target, the best match is found and the new position of the measurement point is recorded. Novel approaches to improving the resolution give the Video Gauge a similar performance to extensometers or strain gauges, but with far more versatility.**




**Improved accuracy with the Video Gauge**




**Basic mode of operation**

## Advantages of the Video Gauge

- **no sample preparation required**
- **user-friendly operation**
- **can fully automate set up and testing;**
- **can handle complex measurements such as Poisson's ratio;**
- **complete picture of test outputs from single piece of equipment;**
- **flexible and scale independent;**
- **can track in 2 dimensions (and 3 with two cameras)**
- **can track multiple targets;**
- **can handle long elongation tests;**
- **can track existing features on sample;**
- **no consumables costs;**
- **can operate with delicate samples that would be damaged by other techniques;**
- **can operate in difficult environments such as corrosive chemicals, high temperatures or high radiation levels;**
- **insensitive to sample size from very large to microscopic samples;**

## Applications to date include, as well as measurements on conventional specimens:

**Real time monitoring of deck displacements in a long span suspension bridge**

**Measurement of the stiffness of a locust's wing using the hairs on the wing as a template**

**Measurement of the mechanical properties of low stiffness cast adhesive samples down to a specimen size of 0.75mm gauge length**

**Measurements of strain in adhesive joints**

**Measurement of the shear component of deformation in a composite three point bend test**

**Measurement of the compaction behaviour of kevlar reinforcements**

**Measurement of the consolidation and chemical shrinkage of a composite laminate during the cure process**

**Measurement of strains in notched composite specimens**

**None of these measurements would be so simple with conventional equipment and most would not have been possible at all**