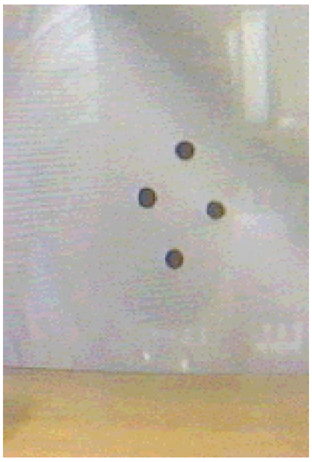
OPTICAL EXTENSOMETER (2-D)

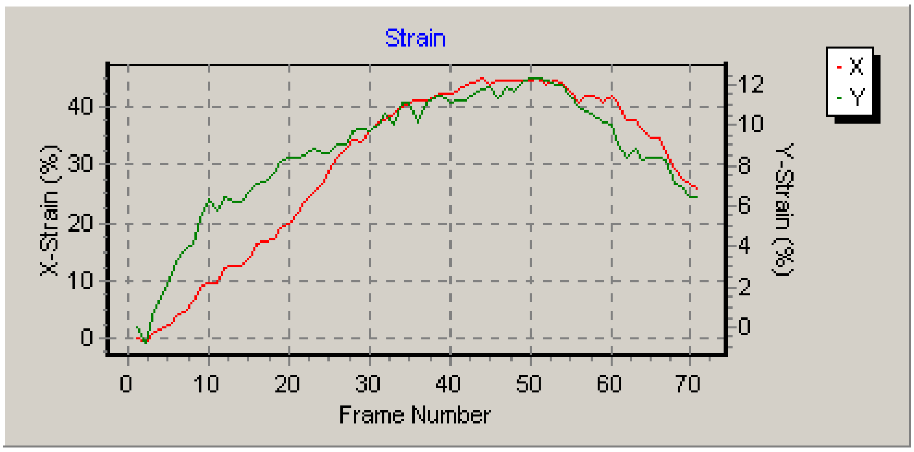
- OEA - Optical Extensometer Analyser
- Low user costs in terms of purchase, use, and maintenance
- Our extensometer is easy to setup and easy to use
- Rapid, reproducible and accurate results given in both numeric & graphical formats
- Data produced can be exported for statistical interpretation and printed to hard copy
- Usable with a wide variety of materials
- Tolerant of testing environment
- Semi portable
- All components are replaceable and upgradable
- 1-D core provides yarn load-strain and much, much more ..., with no steep learning curve for the user
- 2-D extension available as a service for planar applications
- 3-D extension available as a service for non-planar applications

From this ...



A frame captured from a test, showing sample & markers

To this ...



Traces of strain in X & Y directions from individual frames.
Strains are also tabulated for transfer to a spreadsheet or whatever

Want to know more?

Why not contact us for further details ?

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or

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General Introduction to OEA v1.304 (2-D)

OEA (1-D) was designed to determine strictly 1-D motion of detectable (short) edges which are aligned roughly normal to the 1-D motion. However, the ***basic*** processes carried out (both pre-processing & simulated vision processing) are essentially ***2***-D, in that they are designed to sense local sub-pixel polar co-ordinate positional data related to local fragmentary edges (or ***line*** features). The raw output data contain a full description of each & every significant fragmentary edge (or line) in the image. This includes not only the sub-pixel polar properties, but also the local edge (or line) contrast & relative sharpness. This 'contrast' may be selected to be 'brightness' (i.e. grey level) contrast, chromatic contrast (red/green or blue/yellow) or a weighted mixture of any two or all three.

In addition, for ***regular*** use all edge fragments are associated objectively with closed segmented regions (where segmentation is based on continuity of fragmentary edge data) which are themselves catalogued in terms of basic parameters such as size, mean brightness & chromatic properties. From these data, together with the fragmentary edge data, it is possible to reconstruct a 'cartoon' representation of the original scene for visual indication of the degree of fidelity achieved by the segmentation analysis.

From the fragmentary edge data it is possible to generate 'ordered' edge data files, from which progressive local curvature data can then be derived. In addition, such ordered edge data may be progressively smoothed to determine underlying gross curvature trends beneath the local point by point curvature (e.g. the basic mean circumference associated with a cog wheel).

Should it be of any practical use, it would be relatively easy to extend the present data output related to regions to include secondary shape & texture statistics.

Whilst it is obviously always ***possible*** to carry out comparison between any pair of images by comparing the ***output*** data obtained ***separately*** for the pair, such a process can be very time consuming and difficult to automate. To obviate this, an additional facility provided allows for direct point by point comparison to be made during the original image processing. By use of this routing, a normal output of sub-pixel fragmentary edge data & edge-driven region segmentation can be derived from the ***mean*** of the pair of images, whilst at the same time a point by point local edge ***movement*** (disparity) is derived. For any given point this disparity measure is limited to the ***component*** of disparity ***normal to*** the orientation of the local edge fragment (the classically named 'Aperture Problem') but, given a closed region of reasonable size, the collected set of fragment disparities normal to the local edges are usually sufficient to permit derivation of the local ***complete*** (rigid body) movement of the entire region.

Given the versatility & sensitivity of this 2D analysis capability, it is felt that there ***must*** be a miriad of potential practical uses for it. Some ideas are:

- Coastline & other feature mapping from aerial / satellite images
- Shape mapping from coarsely pixellated (low resolution) images
- Mapping of distortions due to shear stress in fabrics and rigid structures (both one off changes and dynamic variations)
- High resolution sensing of local motion within a static scene.

In fact, it should be possible to adapt the facility to sense objectively virtually ***anything*** which the eye can sense and with a similar sensitivity.

Technical Specifications for OEA v1.304 (2-D)

Input/Output specifications of OEA (2-D) are essentially the same as those for OEA (1-D). However, versions of OEA have been supplied with the ability to follow up to 8 markers and optional load monitoring facilities for up to 8 Analogue/Digital channels and other configurations are readily producible.