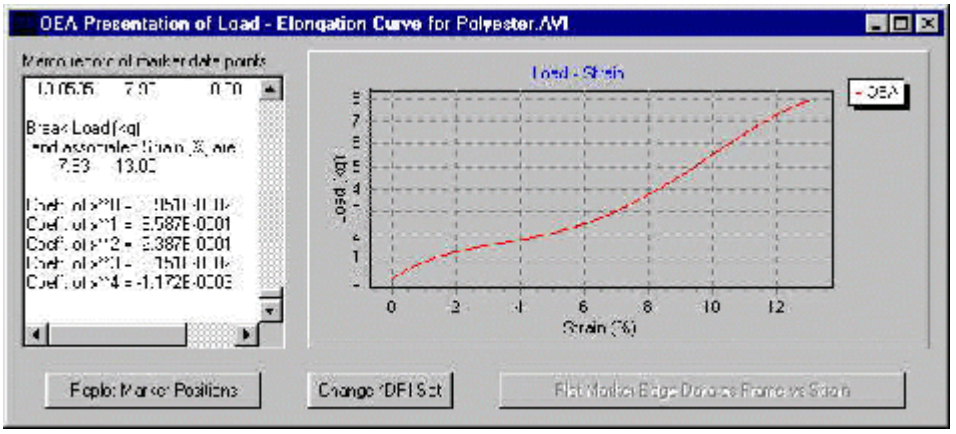
OPTICAL EXTENSOMETER (1-D)

- **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**
- **Bespoke configurations available**
- **1-D core provides yarn load-strain and much, much more ..., with no steep learning curve for the user**
- **2-D & 3-D extensions available as a service for planar and non-planar applications**

From this ...

A frame captured from a test, showing sample & markers

To this ...



Tabulated strain, load & modulus data from individual frames. Plus test output curve, with numeric break point data and 4th order polynomial fit

Want to know more?

Why not contact us to arrange to see for yourself ?

Contact Martin Overington on Tel./Fax: +44 1323 486261
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Technical Specifications for OEA v1.304 (1-D)

The Optical Extensometer Analyser (OEA) is an amalgamation of up to four components

- a user interface providing video playback & decomposition, image sequence analysis & evaluation, and both numerical & graphical interpretation of results,
- image frame analysis to accurately identify marker edge locations on individual frames,
- a video capture device to record the specimen & markers under extension, and
- an optional interface to record analogue test loads, when not directly available digitally.

1) OEA user interface

- Analyse marker edge locations in any frame sequence packaged as an AVI movie file
- Results presented numerically & graphically
- Frame limit defaults to 750 (30 seconds at 25 frames per second) - which produces a 55MB AVI movie file, even with 176x144 pixel frames. Frame limit can readily be increased if desired
- Post capture analysis time dependent on frame size and processor speed - better than 100 frames of 176x144 pixels per minute on 400Mhz Pentium II

OEA is a 32-bit Windows application and therefore requires Windows 9x, NT, or later

- Requires Super VGA display card with True Colour (24 bit) at 800x600 resolution
- Benefits from fast processor, suggested minimum 266MHz Pentium II
- Minimum 16MB RAM for frames up to 176x144 pixels, rising to 64MB RAM to allow processing of 640x480 pixel frames in vertical or horizontal orientations
- Requires adequate hard disc space for storing videos and frame decompositions, realistically 1GB or greater. Special AV discs not required for capture rates up to 30 frames per second
- A CD-Writer is useful for archiving the video test record & OEA analysis
- Video capture device interfaced through Windows API, to generate an AVI movie file, and should therefore support any video capture device that runs under Windows 9x, NT or later
- Analysis phase separate from capture phase, so input frame rate is only hardware dependent

2) Image frame analysis

- Specialised implementation of Ian Overington's image analysis codes, the theory behind which is described in his 1992 book entitled '**Computer Vision - a unified, biologically-inspired approach**', published by Elsevier North Holland Publishing Co.
- Able to detect sub-pixel edge locations to better than a tenth of a pixel - thereby allowing high resolution edge detection from low resolution input images

3) Video capture device

- Must capture 24-bit colour, but frame size of 176x144 pixels is adequate
- Initially conceived around the Parallel Port Creative WebCAM II, but now takes advantage of USB and has been successfully implemented with Creative WebCAM II, Creative WebCAM 3 and 3Com HomeConnect PC Digital WebCam - the latter being the current input device of choice. System requirements for these video conferencing cameras are not too arduous, and are included in the OEA requirements listed above. Note that the USB devices require Windows 98 and a USB port/hub.
- **To receive the best images you must ensure you have adequate lighting**. All other image adjustments depend on the presence of an adequate amount of light. WebCAM sensitivity is similar to that of a home video camera. Although it can operate in low light, the resulting image is not clear. Incandescent lighting is preferable to flourescent lighting. Outdoor lighting also works well.

4) Optional load monitoring

- If present, OEA will control the capture of analogue load signals from an external A/D and interleave these with the video frames being captured
- A/D conversion speed must be at least as fast as the video frame capture speed
- Successfully implemented at up to 30 frames per second (fps) with an A/D channel on a parallel port Pentagon Instruments Supreme miniPOD (note that the Supreme miniPOD requires its own parallel port) and up to 15 fps with a serial port Pico Technology ADC-16.