

High Performance Image Analysis at Low Cost – using a BBC Microcomputer as a real time framestore

The Hawk V8 is a low cost system that enables video images to be written in real time directly into the video display memory of a BBC Microcomputer. Single frames may be grabbed, or moving images analysed. The data capture and transfer is transparent to the computer, leaving the computer's microprocessor

completely free to run whatever image processing software is required.

The Hawk V8 offers a speed of processing unrivalled by similar systems – and at a fraction of the cost. Software is provided to control the Hawk V8, and a library of routines for various image processing and analysis techniques is available.

Advantages

- Real time image capture.
- Real time image processing.
- Low cost.
- Straight forward programming.
- Image analysis software library.
- Readily programmable for special applications
- System easily expanded by adding peripherals.

Applications

- Visual Inspection.
 - Robotics.
 - Microscopy
- Analysis of moving images.
- Image capture for computer graphics.
- Video measurements
- Pseudo colour enhancement.

System Description

The Hawk V8 consists of a separate metal box (which can be used as a monitor stand) cable linked to the BBC Master 128 computer – or a single card directly fitted inside the case of a BBC Model B. Otherwise only a video camera is required. The Hawk V8 is controlled by a software operating system. The computer retains all its usual functions, and peripherals such as disc drives, printers, plotters etc. can be readily added as required.

Software

The Hawk V8 software is in two parts: to provide control of the Hawk V8 hardware, and to perform various image processing and analysis tasks. Whilst the Hawk V8 system is a complete image analysis system in itself, the software routines have been so written that they can be easily incorporated in programs written by users for specific 'tasks'.

Video Operating Software

The operating system is an extension of the BBC Microcomputer Machine Operating System, and is resident in the 16k byte ROM supplied with the Hawk V8. Facilities available include selection of operating mode, image grabbing, set brightness and contrast, control of image size, setting threshold for binary images, control of look-up table for pseudo colour and grey level processing, etc.

Image Analysis Software

A library of image processing and analysis routines is available on ROM. These include image processing techniques such as convolution (digital filtering), segment, edge detection, image compression for storage, average, etc. Analysis algorithms include area, perimeter, length, histogram, count, centroid, etc.

The majority of software routines are available in menu form so that the Hawk V8 becomes an easy to operate image analysis system.

The Hawk V8 software is fully described in a manual that can be obtained from Wild Vision.

Specification Hawk V8

- can be fitted to BBC Master 128 or Model B (using fitting kit provided).
- video input 1v pp 75ohm gen-locked source.
- stored image size:
 - 160 × 256 pixels, 16 grey levels.
 - 640 × 256 pixels, binary image.
- capture rate: 50 frames per second.
- display options:
 1. Live input video signal.
 2. Live digitised image, 16 grey levels displayed in pseudo colour.
 3. Stored image.
- computer generated text and graphics can be freely mixed with video from any of these sources.

- computer control of brightness and contrast of digitised image to 255 levels.
- variable image size.
- Palettemate Graphic Card option allows 16 grey levels to be displayed using colours selected from a palette of 4096 options.



The Hawk V8 can be used to analyse pressure distribution under feet. The isobars may be displayed in 16 levels of pseudo colour, and the centre of gravity and other parameters calculated.



An image processed by the Hawk V8 and displayed in 16 grey levels (or pseudo colours). This shows the high resolution obtained from the Hawk V8.

