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Digi-Eye

DigiEye is a revolutionary none contact digital imaging system that captures and measures the total colour and appearance of 2D and 3D images in a unique controlled lighting environment. The image is then displayed on a calibrated monitor, printed on a profiled printer. DigiEye's ability to select and retrieve colour data from any pixel in the high-resolution image allows the measurement of very small or irregular shaped samples. Measured colours are represented by their 'finger-prints' in terms of colorimetric values or spectral data. Electronic communication of the image and colour data is easy and fast over the World Wide Web using standard formats.

Application

- Textiles: carpets, printed fabric, lingerie, velours
- Building materials: concrete, artex, flooring
- Packaging: metallic and pearlescent boxes and wrappers
- Plastics: phone covers, automotive components
- Foods: biscuits, meats, fruit and cereals, sweets…
- Medical: prosthetics, dentistry
- Cosmetics: eye shadow, lipstick

The System

- The DigiEye system is a complete colour imaging solution combining both hardware and software. The hardware consists of a characterised digital camera, a unique illumination cabinet, and calibrated high definition CRT monitor. The illumination cabinet has been designed to provide even and consistent illumination which meets international standards. The D65 light source has been compared against other commercially available products and proven to be the best fluorescent light source. The basic DigiEye software consists of:

1. Camera characterisation for transforming the camera's RGB input to CIE specifications under the fixed lighting conditions in the cabinet
2. Monitor characterisation for calibrating the CRT to display colour accurate images.
3. Colour measurement for describing the captured images in terms of not colorimetric values and colour constant spectral reflectance values.
4. Texture profiling and simulation builds an image database of representative textures, with the ability to recolour to any desired shade.
5. Colour difference for comparing colour areas on screen using a choice of equations including the latest CIEDE2000

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Advantages

Colour measurement traditionally relied on spectrophotometers. However, spectrophotometers cannot measure small or irregularly shaped areas, curved or heavily textured objects. They cannot take into account the appearance differences between pile fabrics such as velvetand plain-woven cotton such as twill. DigiEye provides a non-contact measurement for all types of materials with different appearance characteristics. It even measures multicoloured and patterned sample down to a single pixels – all with a single click of a button!

Complex shapes and patterns do not present any problem, as DigiEye is able to select automatically areas of adjacent pixels of similar colour. This is just not possiblewith a conventional spectrophotometer.

Physical standards, for example in foods, can be replaced with stored high-resolution digital images. The light and dark limits can be produced for the standards and then printed using profiled low cost ink jet printers. Another application is DigiEye's 'clustering' technique, which automatically groups pixels of the same colour together and calculates the percentage of the total pixels within the image. This feature is an advantage in areas such as meat to calculate the percentage fat or to calculate the total coverage of a chocolate layer on a partially coated biscuit and textile printing to determine the number of colours.

High resolution images can be produced to import into other CAD or display systems. Textile standards and metallic packets have been characterised and then transferred ready for separation.