Colour sensor could detect counterfeit money

Spanish researchers have designed an imaging system that could be used to authenticate currency and documents based on rich colour information.

The team - from the University of Granada - say the sensor technology can obtain 12 times more visual information than the human eye at high speeds, potentially making it suitable for high-throughput screening purposes.

The multispectral imaging sensor is based on transverse field detectors (TFDs), a technology originally developed at the University of Milan in Italy, which the Granada team have coupled to silicon-based sensors with colour filter arrays designed to enrich the colour information that can be extracted from them.

Most colour image sensors -including those deployed in digital cameras - have just three colour channels, while the new sensors developed by the Spanish researchers boast 36 and are "capable extracting … full colour information from each pixel in the image without the need for a layer of colour filter."

In order to do so, they take advantage of a physical phenomenon by virtue of which each photon penetrates at a different depth depending on its wavelength. The new system collects these photons at different depths on the silica surface of the sensor, so different channels of colour can be separated without the necessity of filters.

Aside from counterfeit detection, they technology could also be used for other applications including medical imaging, remote sensing, assisted or automated driving, etc.

The team have reported their work in the journal Applied Optics.

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