Image sensor created from flexible, transparent polymer

A research team from the Johannes Kepler University Linz (Linz, Austria) has developed a new image sensor from a flat, flexible, transparent polymer sheet.

The sensor is based on a polymer film known as a luminescent concentrator (LC), which is suffused with tiny fluorescent particles that absorb a specific wavelength and then reemit it at a longer wavelength.

While some of the reemitted fluorescent light is scattered out of the imager, however, a portion of it travels throughout the interior of the film to the outer edges, where arrays of optical sensors capture the light. A computer then combines the signals to create a gray-scale image.

The main application the researchers envision for the new technology is in touch-free, transparent user interfaces that could seamlessly overlay a television or other display technology. This would give computer operators or video-game players full gesture control without the need for cameras or other external motion-tracking devices.

The polymer sheet could also be wrapped around objects to provide them with sensor capabilities. Since the material is transparent, it's also possible to use multiple layers that each fluoresce at different wavelengths to capture color images.

The team described their new device and its possible applications in a paper entitled "Towards a transparent, flexible, scalable and disposable image sensor using thin-film luminescent concentrators."

Published in the Optical Society's (OSA) open-access journal Optics Express, it is available for download here.

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