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Flexible image sensors of the University of Linz recognizes colors

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A new type of image sensor developed by the University of Linz is flexible, transparent and now also recognizes colors. As researchers reported in the scientific journal "Optics Express", they succeeded in reconstructing color images with the help of a multi-layered plastic film. Part of the color information is calculated by means of adaptive software.

The new sensor does not measure individual image pixels but works according to the principles of computer tomography. The core of the sensor is a thin film which transports the wavelengths of light to the edge of the film. There the light is caught by several thousand detectors. The light distribution at the edge is measured and contains all the information required to reconstruct the original image.

Previous prototypes of sensors developed within the context of this partnership between the University of Linz and Microsoft worked with a single film, and only supplied black and white images. By arranging two different films above one another which respond to different colors, the researchers have now been able to solve this limitation. "A direct advantage of this method is the capability to maintain the original resolution", explained Oliver Bimber, Head of the Institute for Computer Graphics at the University of Linz and head of the research project.

Another advantage of this new method is that the sensors at the edge collect much more information than is required for the reconstruction of the image. With the help of a complex "machine learning" approach, the artificial intelligence can learn from the existing data. "In the preliminary stage, we had our system analyze thousands of images. In this way it more or less learned the connection between the different color components", Bimber added.