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Plasmonic colour filters for CMOS image sensors

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Conventional colour filters in CMOS image sensors are made of dyes or pigments and exploit their particular absorption properties to produce different colours. Plasmonic colour filters are superior to conventional colour filters made of dyes and pigments, especially when the pixel size is reduced to a few microns in size. This is because the dyes or pigments based filters cannot be made much thinner than several hundred nanometres due to their low absorption coefficients as well as due to fabrication of each of the three dye filters for RGB colour schemes demands complex lithographic processes. In addition to these, dyes and pigments based filters are prone to colour cross talk at submicron scale. Colour filters based on plasmonic filters can overcome the above difficulties. Also, the plasmonic filters integrated w i t h CMOS image sensors are environmentally friendly compared to their toxic counterparts. Here, we present plasmonic colour filtersdesign based on localised surface plasmon resonances in aluminium nanodisks that are angle insensitive, polarization insensitive, inexpensive, compatible with existing CMOS technology and have high transmission coefficients.

Biography

Ranjith Rajasekharan Unnithan is Lecturer of Electrical and Electronic Engineering at The University of Melbourne. Ranjith finished his PhD in Electrical Engineering from the University of Cambridge in 2011. After finishing his PhD, he worked as a postdoctoral researcher and project manager in the Electrical Engineering Department at Cambridge for a Samsung project. He joined at the University of Melbourne as a lecturer in 2014. He is recipient of a number of awards; including CambridgeSens innovation awards both in 2009 and 2010 and two awards from Cambridge University Entrepreneurs in 2011 which is reported in Cambridge Elevator news as '25 Cambridge technologies that could change the world'

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