CMOC Abstract:

Keynote – CMOS Image Sensors – From Zero to Billions: A Story of Technology Innovation

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Abstract

Innovation is the process of taking a discovery or invention, and translating it to a product that can be commercialized. In the early 1990's at the NASA Jet Propulsion Laboratory at Caltech, the CMOS active pixel image sensor with intra-pixel charge transfer was invented as a possible solution to problems with the use of charge-coupled devices (CCDs) in interplanetary spacecraft. Over the next several years, the invention was translated into useful products not only for space, but also for down-to-earth use [1]. The CMOS image sensor "camera-on-a-chip", which features much lower power dissipation and much more compact camera size compared to the CCD, enabled miniature mobile cameras for a variety of applications. Applications include cameras in mobile phones, webcams, swallow-able pill cameras for medicine, helmet mounted cameras for sports activity, and many others. Today, over two-billion cameras are made each year using this technology and CMOS image sensors will represent a $10B a year semiconductor component business by 2016.

This invited presentation will discuss the invention, innovation and commercialization arc of the CMOS image sensor technology. The process includes the transfer of technology from JPL and the startup of Photobit Corporation, and the emergence of competitors and industry consolidation.

[1] E.R. Fossum, *Camera-on-a-Chip: Technology Transfer From Saturn to Your Cell Phone*, Technology and Innovation – Journal of the National Academy of Inventors, Vol. 15, pp. 197–209, December 2013. DOI: http://dx.doi.org/10.3727/194982413X13790020921744