

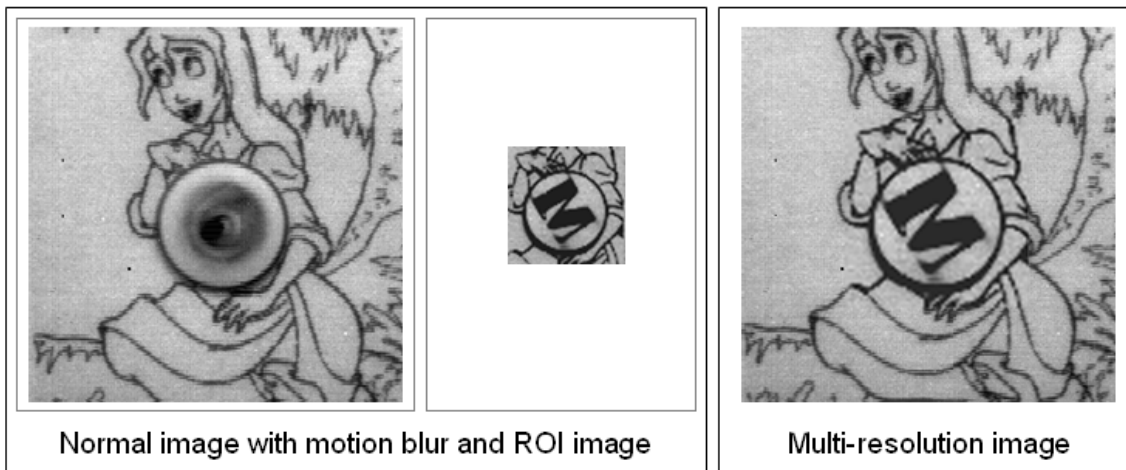


CMOS Image Sensor with Adaptive Frame Rate and Wide Dynamic Range

The CMOS image sensor technology enables an improvement on traditional CMOS image sensors used in image processing devices (cameras). The technology is unique and significant because it takes an existing CMOS image sensor circuit, enables integrated motion detection and improves the dynamic range by 140 dB.

IP Summary:

The growth of video imaging continues to drive the demand for higher performing image sensors. The result is a growing need to handle high speed motion with a low cost, low power sensor. Applications including consumer electronic, automotive, industrial imaging and security demand higher performance and lower cost imaging sensors. Image sensor suppliers are investing to discover ways to address the need for performance while managing the challenging cost targets and reduced power budgets. The CMOS image sensor with adaptive frame rate and wide dynamic range technology increases the performance of a standard, low cost, low power sensor, meeting the needs of the growing market. By detecting motion in a region-of-interest (ROI), the technology reduces the processing requirement for groups of pixels that are not changing while simultaneously allocating processing power for groups of pixels that are changing. By applying this technique, the technology delivers multi-resolution, high dynamic range image using a standard CMOS image platform.



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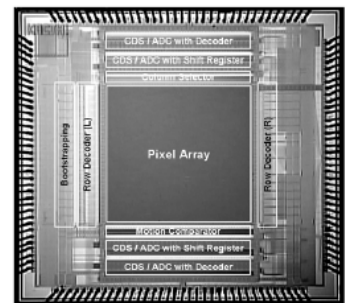
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Market Size:

The world-wide image sensor market is \$4B with the US market \$700MM. Data from Frost & Sullivan reports; 2003 'North American Image and Optoelectronic Color Sensors Markets' and the 2008 'World Image Sensors Market'

Technical Merit:

This IP is valuable because it delivers higher performance image sensing with a cost effective, proven base technology (existing CMOS image sensor). Using existing chip designs and tooling, suppliers can implement this technology and provide a step change in image sensing performance. The proposition to suppliers; deliver next generation performance using a proven and established design platform, delay the need to fund the advancement of a new design from concept to production. Utilize this technology on all future designs ensuring that your sensor offering is always one step higher in performance than the competition with the same or lower cost.



Commercial / Technical Challenges:

Technical; The technology has been proven with two iterations of prototype design with fabrication supported by a large multinational sensor supplier. Test data is available and a prototype demonstrator is available for inspection and hands on validation.

Commercial; The next step is generating awareness of the technology and connecting with the image sensor suppliers. A significant amount of prototyping, testing and evaluation has been completed and together with the significant market opportunity justifies a fairly high value for this IP.

Patent Landscape:

- US 11/851,957 Spatial-temporal Multi-resolution Image Sensor with Adaptive Frame Rates for Tracking in a Region of Interest
- PCT/US2008/077927 Image Sensor with High Dynamic Range Imaging and Integrated Motion Detection

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Publications / References:

Jaehyuk Choi; Sang-Wook Han; Seong-Jin Kim; Sun-Il Chang; Euisik Yoon, “A Spatial-Temporal Multiresolution CMOS Image Sensor With Adaptive Frame Rates for Tracking the Moving Objects in Region-of-Interest and Suppressing Motion Blur”; Solid-State Circuits, IEEE Journal of , vol.42, no.12, pp.2978-2989, Dec. 2007

Sang-Wook Han; Seong-Jin Kim; Jae-Hyuk Choi; Choong-Ki Kim; Euisik Yoon, “A High Dynamic Range CMOS Image Sensor with In-Pixel Floating-Node Analog Memory for Pixel Level Integration Time Control”; VLSI Circuits, 2006. Digest of Technical Papers. 2006 Symposium on, vol., no., pp.25-26, 0-0 0

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