

Current Starved Ring Oscillator Image Sensor

Authors : Devin Atkin, Orly Yadid-Pecht

Abstract : The continual demands for increasing resolution and dynamic range in CMOS image sensors have resulted in exponential increases in the amount of data that needs to be read out of an image sensor, and existing readouts cannot keep up with this demand. Interesting approaches such as sparse and burst readouts have been proposed and show promise, but at considerable trade-offs in other specifications. To this end, we have begun designing and evaluating various new readout topologies centered around an attempt to parallelize the sensor readout. In this paper, we have designed, simulated, and started testing a new light-controlled oscillator topology with dual column and row readouts. We expect the parallel readout structure to offer greater speed and alleviate the trade-off typical in this topology, where slow pixels present a major framerate bottleneck.

Keywords : CMOS image sensors, high-speed capture, wide dynamic range, light controlled oscillator

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