**Enabling seamless video processing in smart surveillance cameras with multicore**

**Abstract—**

Smart video surveillance is an area of research focus in smart city technology. Smart camera design for this task needs to perform seamless video processing. Multicore is one solution to achieve high performance. In this paper, we propose a pipelined parallel architecture for smart video surveillance that is appropriate for implementation on a multicore environment. The architecture comprises of modules for video frame acquisition and image processing operations performed in sequence on an image frame. Successive lines of a frame are processed in a pipeline on the multicore. Embedded system realization on a multicore XMOS microcontroller runs the drivers for interfacing image sensor and LCD on different cores along with the various stages of the image processing pipeline. The realization achieves a frame rate of 8 frames/second for an image size of 480×272. Further, the solution is area-efficient without the need for a large external memory and is based on a single XMOS sliceKIT with support (in the form of compact slices) for camera, LCD and other units.