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# FPGA IP Cores for Video Content Analysis

## Processing Power of Intelligent Cameras Multiplied

With the Cellular Multicore Video Analytics™ (C-MVA) processor, AnaLogic Computers enables camera manufacturers, system integrators, and application engineers to achieve greatly accelerated image processing performance in embedded applications designed for the rapidly growing intelligent security/surveillance camera market.

C-MVA is the newest practical application to emerge from AnaLogic's Cellular Visual Technology™ (CVT). Developed in concert with Eutecus, Inc., AnaLogic's US-based sister company, CVT's groundbreaking use of massively parallel cellular array structures for ultra-fast image processing received the prestigious Innovation Award from the In-Stat Microprocessor Report in February, 2007.

The C-MVA system is composed of a cascade of highly optimized processing blocks embedded in FPGA, which takes over the computationally-intensive, pixel-level early tasks of the video processing flow (such as noise filtering and signal reconstruction, foreground-background separation, and morphological shape and structure extraction) that would otherwise be handled by the main processor inside an intelligent camera (e.g., a DSP).

C-MVA processes 8-bit grayscale input from the image sensor or other source and produces a black-and-white output image of salient features, which can then be streamed for higher-level on-board processing and analysis.

C-MVA is currently configured to run on the Spartan 3 @ FPGA (with 32 MB SDRAM) embedded in AnaLogic Computer's Bi-i™ V301F Intelligent Camera reference design and fully integrated into AnaLogic's InstantVision™ Integrated Software Environment (IV ISE). AnaLogic works closely with OEMs at all levels to help them take advantage of CVT applications on a wide variety of hardware and software platforms.

In its current implementation, C-MVA pre-processes 320 x 240 resolution images at a rate of 30 FPS. AnaLogic's multicore CVT provides almost unlimited scope for increased pixel rate. The individual cores that constitute the C-MVA are also available as separate IP blocks for implementation in other FPGA configurations.

For more information on the IP blocks, how to license them, and availability of future releases, contact AnaLogic Computers.

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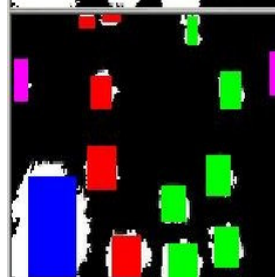
### STEP 1: Grayscale Sensor Input

Busy traffic scene. Instead of sending it directly to the DSP, the sensor first sends it to C-MVA for pre-processing.



### STEP 2: C-MVA Performs Pixel-Level Parallel Pre-Processing:

- Noise filtering and signal reconstruction,
- Foreground-background separation,
- Morphological processing, And streams processed images to DSP.



### STEP 3: DSP Performs Only High-Level Image Processing:

- Detection and tracking,
- Feature classification,
- Behavior analysis, And sends meta-data about events to server.

### Features:

- Enables the implementation of high-speed video analytics applications embedded in intelligent cameras and other image processing devices;
- On-board image processing reduces strain on bandwidth and central server;
- Highly optimized multicore image processing—each core is specialized to perform its own task;
- Improved performance through parallel processing;
- Frees DSP to focus on higher-level processing.

### Overview of C-MVA System



For More Information Call AnaLogic Computers at +36 1 371-0871 or Email [info@analogic-computers.com](mailto:info@analogic-computers.com)