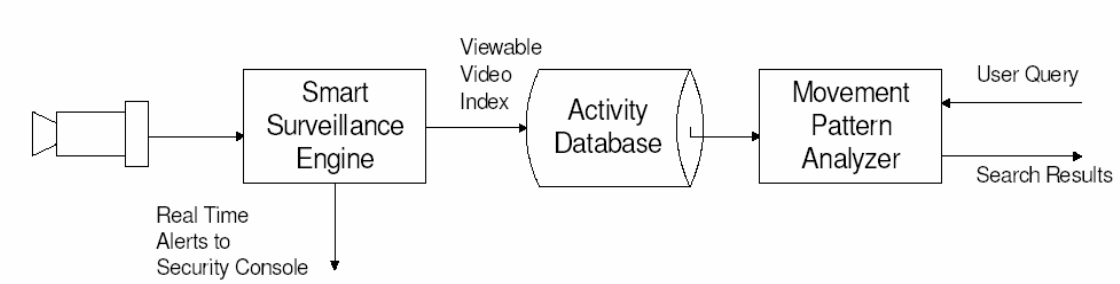
Video Surveillance Demo
on Cell Processor Based Blade

May 13th, 2005

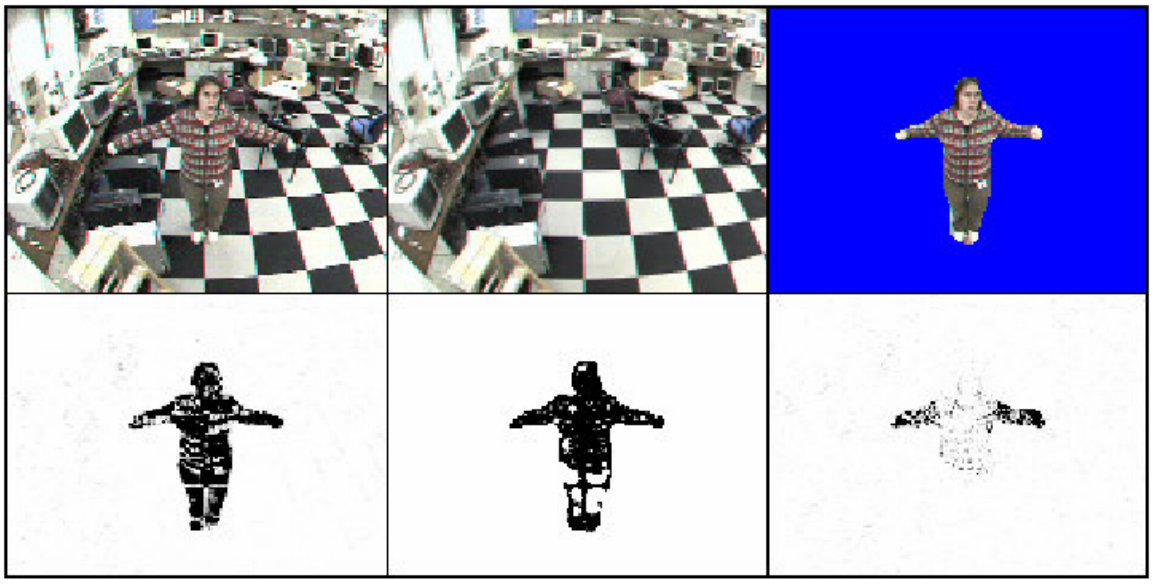
IBM's smart surveillance system relies on a number of visual analysis technologies to detect moving objects in video and to track those objects. Smart surveillance engine consisting of these analysis technologies, processes the incoming video from a camera and stores the viewable video index in the activity database.



The video surveillance middleware supports the querying of the database for various patterns useful for the security personnel to monitor the cameras either in real-time or for later retrieval.

The smart surveillance engine consists of two main algorithms; background subtraction (BGS) algorithm to detect objects and object tracker to track the detected objects. The background subtraction module combines evidence from differences in color, texture, and motion. The BGS consisting of compute intensive image processing algorithms can benefit from media processing elements of various processors.

By utilizing the Cell processor's media processing capabilities, these image processing algorithms can process more camera inputs. With the Cell Processor based blades, the number of servers required in a surveillance system can be reduced in turn reducing the total cost of ownership. The algorithm level performance of some of the surveillance kernels optimized for Cell processor was significant.



Background subtraction compares the current image (top left) with a reference image (top middle) to find the changed regions (top right) corresponding to objects of interest. Our system uses multiple modalities to locate change regions.
It combines saliency from color shifts (bottom left), differences in edge texture (bottom middle), and motion energy (bottom right) to give a more robust segmentation.

In this demo, the BGS algorithm, running on Cell processor based blade, processes a live camera input and sends the detected objects to the client application to be shown to the user. The full surveillance application includes the object detection, tracking and the database to store the object information. The database can be queried based on the time, object type and various other events.

Authored By:

Sreenivasulu Kesavarapu
IBM Research
sulu@us.ibm.com
914-945-1327

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Systems and Technology Group
Route 100
Somers, New York 10589

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May 2005
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