Motivation:
The Photoshop technology, as a very charming technology, is utilized to obtain various vivid effects for photo post-processing. However, the Photoshop technology is mostly based on still image processing. Our project focuses on applying Photoshop technology to video instead of image. Our system is responsible for adding special effects on captured video frames and performing the processed frames in real time. The implemented effects in our system include “Pencil Sketch”, “Pen sketch” and “Watercolor”.

Main Challenges:
--Real time implementation

When we add special effects on the 30 frames per second video instead of the still image, how to make it not only in real time but also vivid is the main challenge. We employ two main approaches:
- Downscale the original frame
- Block-based variation detection

Downscale:
The downscale method helps us to avoid processing too many pixels. At last, the processed frame will be interpolated back to the original size.

Block-based variation:
The block-based variation helps us to exploit the temporal redundancy when two frames are similar to each other. It decreases our system’s complexity by directly using the previous frame’s result if there is little or even no variation within a block.

Fig.1 Architecture of the system.

Results:
Our system is able to provide robust and accurate results of “Pencil Sketch”, “Pen sketch” and “Watercolor”.
The results can be observed from Fig.1 and Fig.2. (a),(b) and (c).

Fig.2: (a) pencil sketch  (b) watercolor  (c) pen sketch

Application Filed:
This system can be adopted in multiple circumstances, such as digital video camera, video clips browsers, surveillance, and build-in entertainment apps. In details, our ideas in complexity reduction help a film editor boost his efficiency. Furthermore, our system can give a web site designer a huge inspiration as a novel technology. Even more, our system can do surveillance video enhancement as well.