Abstract

The usage of HD videos has become widely spread into almost every aspect of modern life. There’s a need to develop filters and image processing techniques to take a human observer’s attention off of any abnormality in a video stream, such as surveillance video footage. Software techniques solely might not have the ability to process a great number of frames efficiently unless operating on a high-tech device such as a state-of-the-art supercomputer however that’s not an affordable to most users. Hence there’s a demand for a reliable yet, affordable method to filter HD videos, which is the aim of this research.

Removing Raindrops from a real-time video stream requires heavy image processing and computations which may cause an observer to miss a piece of information like a car’s plate number. The proposed technique takes raw image input from a video frame and converts it into a binary image using pure hardware implemented with an FPGA circuit. Then the binary image is processed using FastICA technique under Raspberry Pi machine to make raindrops simpler
to remove and then renders the video frame to a High Definition Multimedia Interface (HDMI) cable to be displayed on the screen.

**References**


**Index Terms**

Computer Science  
Signal Processing

**Keywords**
HD video, FPGA, FastICA, Raspberry Pi, HDMI