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DIGITAL VIDEO RECORDER / PLAYER

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MPEG-4 is a state-of-the-art multimedia compression standard. This final year project aims at developing a digital video recorder that runs on Linux machines. The recorder adopts the MPEG-4 video standard and Advanced Audio Coding (AAC) as compression standards. The recorder speed is of primary concern. Therefore, Streaming SIMD Extensions 2 technology (SSE2) in the Intel Pentium® 4 processor is employed to construct the recorder.

![System Block Diagram](image)

**Figure 1: System Block Diagram**

The digital video recorder receives signals from TV capture card installed in the server. The video and audio encoders compress the signals for transmission via the system layer. The player at client side receives control data and streaming signals for playback at any time.
The digital video recorder provides real time recording and streaming of television programmes. Users can also watch television programmes with the recorder. Other users can enjoy the streamed videos via the network with the video player. Utilizing limited system resources, the recorder does not affect the system performance significantly. In addition, the recorder has the following features:

2. **Automatic Channel Scanning** – scans and stores channel frequencies for easy selection of channels

3. **Scheduled Recording** – records TV programmes according to user preferences

4. **Video Size Adjustment**

5. **Video Scene Capture**

6. **Chat Room** – allows instant sharing among audience
The Linux machine for testing has the following configurations:
Desktop with Intel Pentium® 4 2.4GHz processor and 512MB main memory
Operating System: Redhat Linux 8.0

Referring to the above graph, our video encoder achieves a rate at around 90 frames per second, whereas the audio encoder can encode one minute of music in about 14 seconds. The resources required to execute the recorder are limited. In real time recording and streaming of television programmes, the CPU usage is about 55% and about 3.3% of main memory is utilized.