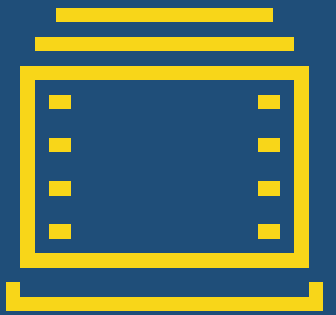


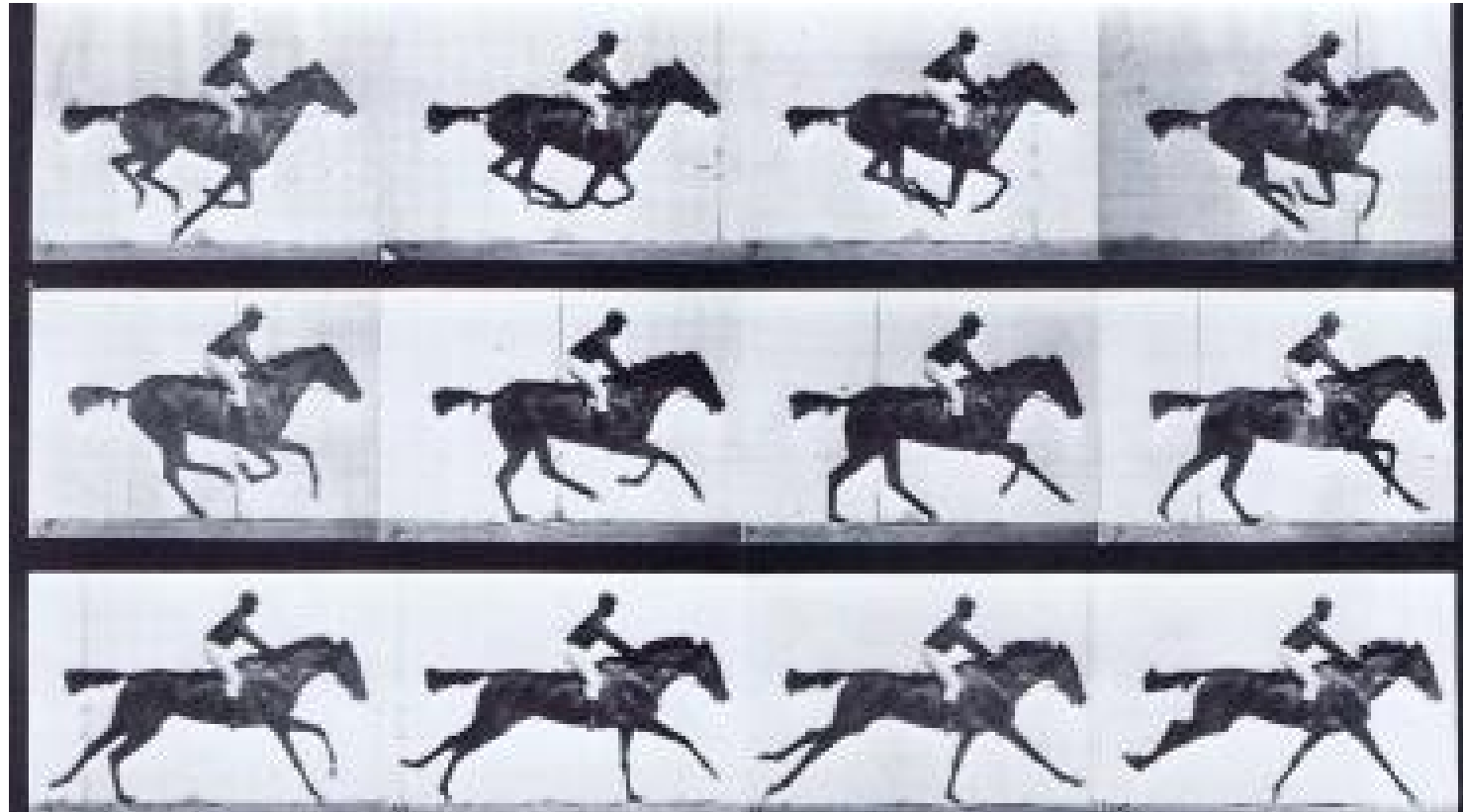
Multimedia-Lecture- Seven Video





Video Concept

Video is a series of digital signals, which simulate movement.



Dealing With Video in MATLAB

- Read a Video File
- Find More information about Video
- Read Frame
- Read Video Frames Starting At Specific Time
- Read Video Frames Using Frame Index
- Create VideoWriter Object and Write Video

Read a Video File:

```
VideoCapture videoCapture = new VideoCapture(path);
```

Find More information about Video:

```
int totalFrames = (int)videoCapture.Get(CapProp.FrameCount);  
// Get frame width  
int frameWidth = (int)videoCapture.Get(CapProp.FrameWidth);  
// Get frame height  
int frameHeight = (int)videoCapture.Get(CapProp.FrameHeight);  
// Get frames per second (FPS)  
double fps = videoCapture.Get(CapProp.Fps);
```

The videoCapture object has properties that contain information about the video file.

Try to find more Properties

Read Frame:

```
Mat frame = new Mat();  
while (videoCapture.Read(frame))  
{  
    // Check if the frame is valid  
    if (!frame.IsEmpty)  
    {  
        Console.WriteLine(frame.Width);  
    }  
}
```

Read Video Frames Starting At Specific Time:

```
// Specify the reading to begin 2.5 seconds from the beginning of the video
double startTimeSeconds = 2.5;
videoCapture.Set(CapProp.PosMsec, startTimeSeconds * 1000);
// Create an axes object to display the frame
Mat frame = new Mat();
// Continue to read and display video frames until no more frames are available to read
while (true)
{
    // Read a frame from the video
    if (!videoCapture.Read(frame))
        break;
    // Display the frame
    CvInvoke.Imshow("Video Frame", frame);

    // Wait for a short period (simulate frame rate)
    CvInvoke.WaitKey((int)(1000 / videoCapture.Get(CapProp.Fps)));
}
// Release resources
CvInvoke.DestroyAllWindows();
videoCapture.Dispose();
```

Read Video Frames Using Frame Index

```
int frameIndex = 200; // Read frame at index 200
videoCapture.Set(CapProp.PosFrames, frameIndex); // Create an axes object to display the frame
Mat frame = new Mat();
// Continue to read and display video frames until no more frames are available to read
while (true)
{
    // Read a frame from the video
    if (!videoCapture.Read(frame))
        break;
    // Display the frame
    CvInvoke.Imshow("Video Frame", frame);

    // Wait for a short period (simulate frame rate)
    CvInvoke.WaitKey((int)(1000 / videoCapture.Get(CapProp.Fps)));
}
// Release resources
CvInvoke.DestroyAllWindows();
videoCapture.Dispose();
```

Video Format



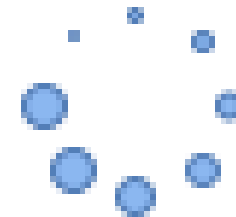
Create VideoWriter Object and Write Video:

```
// Load the image
Mat image = CvInvoke.Imread(path);
// Get the frame size from the image
int frameWidth = image.Width;
int frameHeight = image.Height;
// Create a VideoWriter object to write the video
int codec = VideoWriter.Fourcc('H', '2', '6', '4'); // Codec for MP4
double fps = 30; // Frames per second
using (VideoWriter videoWriter = new VideoWriter(outputVideoPath, codec, fps, new System.Drawing.Size(frameWidth,
frameHeight), true))
{
    // Check if the VideoWriter object is initialized successfully
    if (!videoWriter.IsOpened)
    {
        Console.WriteLine("Failed to create VideoWriter.");
        return;
    }
    // Write the same image frame to the video multiple times (e.g., 100 frames)
    int numFrames = 100;
    for (int i = 0; i < numFrames; i++)
    {
        videoWriter.Write(image);
    }
    Console.WriteLine("Video with one image frame has been created successfully.");
}
```


Exercise:

- I. Write a C#-code to:
 - a. Read a video file.
 - b. Reverse frames of that video.
 - c. Write a reserved video on your disk.

Remain RGB as it's, only
reserve the frames



That's All