Multimedia-Lecture-Seven

Video

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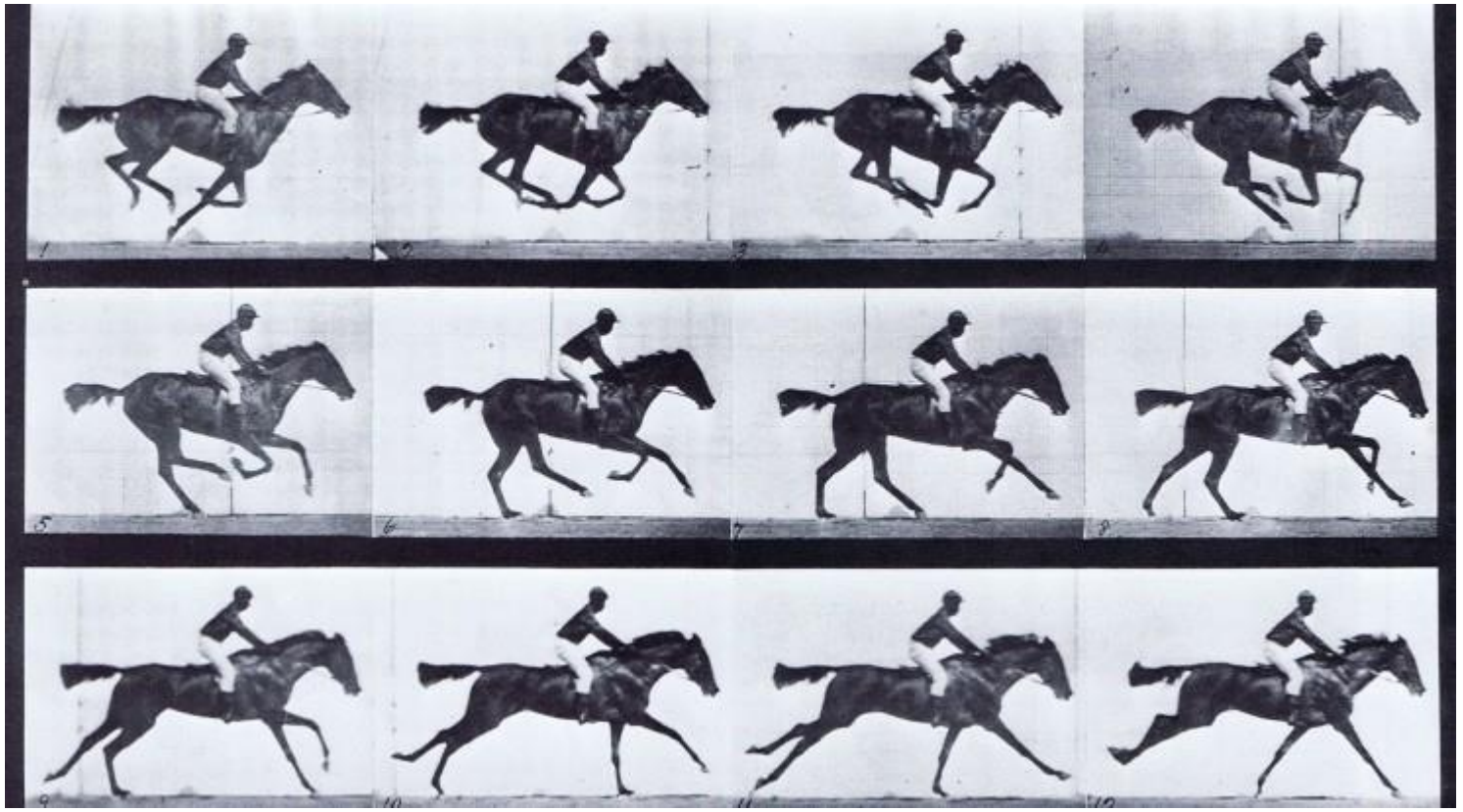
Video Concept

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);
```

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

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);
```

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);
          }
     }
```

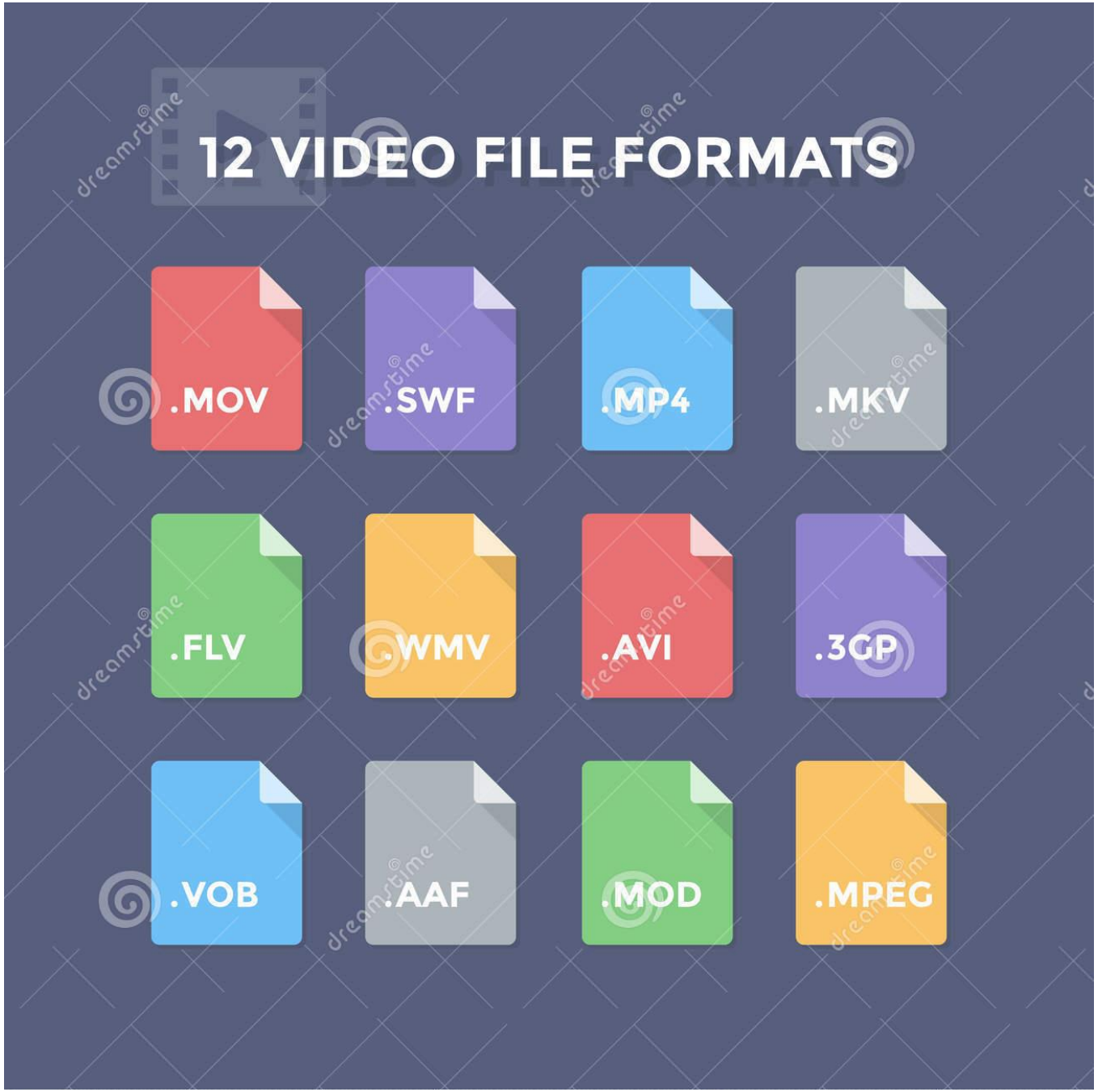
Read Video Frames Starting At Specific Time:

```
 // 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:

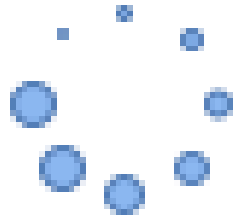
I. Write a C#-code to:

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