Lecture 23

HTML5 Drawing Canvas and Video

* Course logo spider web photograph from Morguefile openstock photograph by Gabor Karpati, Hungary.
The Canvas

- A general purpose drawing canvas
- Many of the standard capabilities:
  - Curves, filled solids, text, effects, ...
- Learning curve probably depends,
  - Conventions look standard to one familiar with multiple graphic APIs.
- Brief introduction here through an animated spinny.
Spinny in JavaScript and HTML5.

This is an example of using timed events to set an animation in motion.
PHP/HTML Code

Not much happening here ...

Here is a blank ... (what shall we call it? :-) where drawing will later take place.
In case we never discussed it before, placing an image into a part of a page using CSS is very different from using an HTML img tag.
Spinny.js – Setup/Globals.

```javascript
var i, dots, row, col;
var stones; // Canvas displaying image and spinny
var ctxt; // The drawing context of the Canvas
var radius = 64; // Dots form a circle of this radius
var dotr = 10; // Dots have this radius
var theta = 0.0; // Starting angle of first dot
var delta = Math.PI / 8
var voff = 150; // Offset from right edge
var hoff = 150; // Offset from top edge
```

Note the use of the Math library.

Also think about how theta will be made to vary with time.
Spinny.js – Initialization.

The animation is set in motion using a JavaScript initialization function.

```javascript
function init() {
    stones = document.getElementById("stones");
    ctx = stones.getContext('2d');
    placeDots();
    setTimeout(doStep, 100);
}
```
Spinny.js – Place Dots.

- There are ten dots.
- Each drawn by the drawDot function.

```javascript
function placeDots() {
    ctx.clearRect(0, 0, stones.width, stones.height);
    for (i = 0; i < 10; i++) {
        row = voff + (radius * Math.cos(theta + (i * delta)));
        col = hoff + (radius * Math.sin(theta + (i * delta)));
        drawDot(row, col, (1.0 - i/10));
    }
}
```
Spinny.js – Draw Dot.

- With HTML5 we see a true 2D API.
- Drawing contexts.
- Paths, arcs, fills & strokes.

```javascript
function drawDot(xpos, ypos, alpha) {
  contxt.beginPath();
  contxt.globalAlpha = alpha;
  contxt.arc(xpos, ypos, dotr, 0, 2 * Math.PI, false);
  contxt.fillStyle = '#ff3f04';
  contxt.fill();
  contxt.strokeStyle = '#000000';
  contxt.lineWidth = 2;
  contxt.stroke();
}
```
More on HTML5 Drawing

Part 1: HTML5 Canvas Basic Tutorials Introduction

Welcome to Basic Tutorials! In these tutorials we’ll focus on the fundamental drawing capabilities of the HTML5 Canvas, including line and curve drawing, path drawing, shape drawing, gradients, patterns, images, and text.

HTML5 Canvas Basic Tutorials Prerequisites

All you need to get started with Basic Tutorials is a modern browser such as Google Chrome, Firefox, Safari, Opera, or IE9, a good working knowledge of JavaScript, and a simple text editor like notepad.
Change of Topic: Video
Web Video – Ancient History

May 2005
Managing video formats was nightmarishly complex, often leading to Flash!
HTML5 Video – Better!

From Wikipedia, the free encyclopedia

The HTML5 specification introduced the video element for the purpose of playing videos,[1] partially replacing the object element. HTML5 video is intended by its creators to become the new standard way to show video on the web without plugins, instead of the previous de facto standard of using the proprietary Adobe Flash plugin, though early adoption was hampered by lack of agreement as to which video coding formats should be supported in web browsers.

Contents [hide]
1 History of <video> element
2 <video> element examples
Two Formats Emerging

- **Webm**
  - Unencumbered by I.P. claims, hence
  - OpenSource Compatible
  - Backed by Google

- **H2.64 (MPEG4)**
  - Good quality, well supported, but ...
  - Users are expected to pay license/royalty
So, encode with both ...
Plays on Firefox, Safari, ...

Displaying video in HTML 5.
Displaying embedded video has become much easier in HTML 5. Below is a 19 clip from a video of the German airship Graf Zeppelin flying over the Netherlands.
Think about a list of options and then the browser moves down the list until it finds a suitable option.