Лекц 10

CANVAS, WEBGL

WebGL жишээ

The Next Gallery

Best Examples of WebGL Websites/Inspirations - CSS Nectar CSS Gallery

30 Best WebGL Sites For 2015 (cssdesignawards.com)

30 Experimental WebGL Websites (awwwards.com)

HTML Canvas

- Скриптээр (ихэвчлэн JavaScript) график зураг зурахад хэрэглэгддэг
- Зөвхөн график дүрс хийх агуулагч таг юм. График зурахын тулд скрипт ашиглах ёстой
- Зам, хайрцаг, тойрог, текст зурах, зураг нэмэх хэд хэдэн аргатай

Жишээ

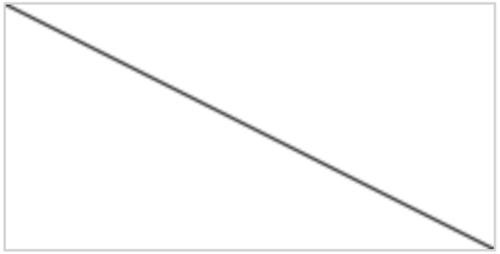
```
<canvas id="myCanvas"
    width="200" height="100"
    style="border:1px solid #000000;">
</canvas>
```

Тэгш өнцөгт зурах

```
<script>
// Canvas тагийн обьектыг авна
var canvas = document.getElementById("myCanvas");
// Canvas-н зургийн обьектыг авна
var ctx = canvas.getContext("2d");
// Зурах дүрсний өнгийг улаан болгоно
ctx.fillStyle = "#FF0000";
// Тэгш өнцөгт дүрс зурна
ctx.fillRect(0, 0, 150, 75);
</script>
```

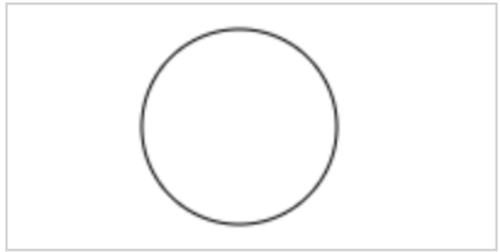
Зураас татах

```
// Canvas тагийн обьектыг авна
var canvas = document.getElementById("myCanvas");
// Canvas-н зургийн обьектыг авна
var ctx = canvas.getContext("2d");
// Эхлэлийг цэгийг байрлуулна
ctx.moveTo(0, 0);
// Зураас татах цэгийг байруулна
ctx.lineTo(200, 100);
// Зураас татна
ctx.stroke();
```



Тойрог зурах

```
// Canvas тагийн обьектыг авна
var canvas = document.getElementById("myCanvas");
// Canvas-н зургийн обьектыг авна
var ctx = canvas.getContext("2d");
// Зам зурахыг эхлүүлнэ
ctx.beginPath();
// Зам дээр зурах тойргийг тохируулна
ctx.arc(95, 50, 40, 0, 2 * Math.PI);
// Замыг зурна
ctx.stroke();
```



Уусгалттай өнгө

- createLinearGradient(*x,y,x1,y1*)
  - шугаман уусгалттай өнгө

- createRadialGradient(*x,y,r,x1,y1,r1*)
  - цацраг уусгалттай өнгө

Шугаман үүсгалттай өнгө

```
var c = document.getElementById("myCanvas");
var ctx = c.getContext("2d");
// Create gradient
var grd = ctx.createLinearGradient(0, 0, 200, 0);
grd.addColorStop(0, "red");
grd.addColorStop(1, "white");
// Fill with gradient
ctx.fillStyle = grd;
ctx.fillRect(10, 10, 150, 80);
```

Цацраг үүсгэлттэй өнгө

```
var c = document.getElementById("myCanvas");
var ctx = c.getContext("2d");
// Create gradient
var grd = ctx.createRadialGradient(75, 50, 5, 90, 60, 100);
grd.addColorStop(0, "red");
grd.addColorStop(1, "white");
// Fill with gradient
ctx.fillStyle = grd;
ctx.fillRect(10, 10, 150, 80);
```

Бичиг бичих

```
var canvas = document.getElementById("myCanvas");
var ctx = canvas.getContext("2d");
ctx.font = "30px Arial";
ctx.fillText("Hello World", 10, 50);
```

Бичиг хүрээлэх

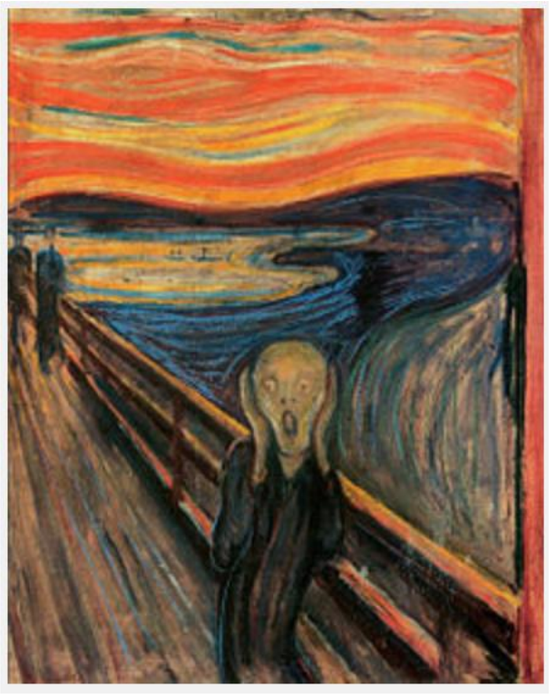
```
var canvas = document.getElementById("myCanvas");
var ctx = canvas.getContext("2d");
ctx.font = "30px Arial";
ctx.strokeText("Hello World", 10, 50);
```

Бичигний өнгө, зэрэгцүүлэлт

```
var canvas = document.getElementById("myCanvas");
var ctx = canvas.getContext("2d");
ctx.font = "30px Comic Sans MS";
ctx.fillStyle = "red";
ctx.textAlign = "center";
ctx.fillText("Hello World", canvas.width/2,
canvas.height/2);
```

Зураг оруулах

```
window.onload = function() {
  var canvas = document.getElementById("myCanvas");
  var ctx = canvas.getContext("2d");
  var img = document.getElementById("scream");
  ctx.drawImage(img, 10, 10);
};
```



Colors, Styles, and Shadows

Property	Description
fillStyle	Sets or returns the color, gradient, or pattern used to fill the drawing
strokeStyle	Sets or returns the color, gradient, or pattern used for strokes
shadowColor	Sets or returns the color to use for shadows
shadowBlur	Sets or returns the blur level for shadows
shadowOffsetX	Sets or returns the horizontal distance of the shadow from the shape
shadowOffsetY	Sets or returns the vertical distance of the shadow from the shape

Colors, Styles, and Shadows

Method	Description
createLinearGradient()	Creates a linear gradient (to use on canvas content)
createPattern()	Repeats a specified element in the specified direction
createRadialGradient()	Creates a radial/circular gradient (to use on canvas content)
addColorStop()	Specifies the colors and stop positions in a gradient object

Line Styles

Property	Description
lineCap	Sets or returns the style of the end caps for a line
lineJoin	Sets or returns the type of corner created, when two lines meet
lineWidth	Sets or returns the current line width
miterLimit	Sets or returns the maximum miter length

Rectangles

Method	Description
rect()	Creates a rectangle
fillRect()	Draws a "filled" rectangle
strokeRect()	Draws a rectangle (no fill)
clearRect()	Clears the specified pixels within a given rectangle

Paths

Method	Description
fill()	Fills the current drawing (path)
stroke()	Actually draws the path you have defined
beginPath()	Begins a path, or resets the current path
moveTo()	Moves the path to the specified point in the canvas, without creating a line
closePath()	Creates a path from the current point back to the starting point
lineTo()	Adds a new point and creates a line to that point from the last specified point in the canvas
clip()	Clips a region of any shape and size from the original canvas
quadraticCurveTo()	Creates a quadratic Bézier curve
bezierCurveTo()	Creates a cubic Bézier curve
arc()	Creates an arc/curve (used to create circles, or parts of circles)
arcTo()	Creates an arc/curve between two tangents
isPointInPath()	Returns true if the specified point is in the current path, otherwise false

Transformations

Method	Description
scale()	Scales the current drawing bigger or smaller
rotate()	Rotates the current drawing
translate()	Remaps the (0,0) position on the canvas
transform()	Replaces the current transformation matrix for the drawing
setTransform()	Resets the current transform to the identity matrix. Then runs transform()

Text

Property	Description
font	Sets or returns the current font properties for text content
textAlign	Sets or returns the current alignment for text content
textBaseline	Sets or returns the current text baseline used when drawing text

Method	Description
fillText()	Draws "filled" text on the canvas
strokeText()	Draws text on the canvas (no fill)
measureText()	Returns an object that contains the width of the specified text

Image Drawing

Method	Description
drawImage()	Draws an image, canvas, or video onto the canvas

Pixel Manipulation

Property	Description
width	Returns the width of an ImageData object
height	Returns the height of an ImageData object
data	Returns an object that contains image data of a specified ImageData object

Method	Description
createImageData()	Creates a new, blank ImageData object
getImageData()	Returns an ImageData object that copies the pixel data for the specified rectangle on a canvas
putImageData()	Puts the image data (from a specified ImageData object) back onto the canvas

Compositing

Property	Description
globalAlpha	Sets or returns the current alpha or transparency value of the drawing
globalCompositeOperation	Sets or returns how a new image are drawn onto an existing image

Other

Method	Description
save()	Saves the state of the current context
restore()	Returns previously saved path state and attributes
createEvent()	
getContext()	
toDataURL()	

Анхаарал тавьсанд баярлалаа!

Асуулт байна уу ?