

SVG definice, gradienty, filtry

Cvičení 5

Z8144 Počítačová grafika v kartografii

Jaro 2020

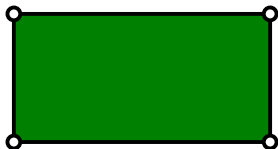
Filip Leitner

	Téma	Zadanie	Odovzdanie	Body	Poznámka
9.3	Základy JavaScriptu, SVG	1			
16.3	JavaScript a SVG	2	1	10	do cvika
23.3	Interaktivita SVG + JavaScript	3	2	10	do cvika
30.3	Konzultácie				
6.4	Tvorba a export SVG	4	3	10	do 2.4.2021
13.4	Konzultácie				
20.4	SVG definície, gradienty, filtry				
27.4	HTML5 Canvas	5+6	4	40	do 23.4.2021
4.5	Konzultácie		5	nebodované	do cvika
11.5	Konzultácie				
18.5	Konzultácie		6	60	do cvika
25.5	Záver		Opravy		

Slouží především k předdefinování znovupoužitelných prvků nebo stylů, které samy o sobě neposkytují žádnou vizuální reprezentaci.

DEFS – DEFINICE OBJEKTŮ

```
<svg xmlns:xlink="http://www.w3.org/1999/xlink" width="250" height="120"
  style="background-color:white">
  <defs>
    <rect id="rect1" width="200" height="100" x="10" y="10" fill="green" stroke="black"
      stroke-width="3"/>
    <circle id="circ1" cx="10" cy="10" r="5" fill="white" stroke="black" stroke-width="3"/>
  </defs>
  <use xlink:href="#rect1"/>
  <use xlink:href="#circ1"/>
  <use x="200" xlink:href="#circ1"/>
  <use y="100" xlink:href="#circ1"/>
  <use x="200" y="100" xlink:href="#circ1"/>
</svg>
```



lineární × radiální

LINEÁRNÍ GRADIENTY

```
<svg width="250" height="120">  
  <defs>  
    <linearGradient id="g1" x1="100%" x2="100%" y1="0%" y2="100%">  
      <stop offset="0%" stop-color="white"/>  
      <stop offset="60%" stop-color="blue"/>  
      <stop offset="100%" stop-color="black"/>  
    </linearGradient>  
  </defs>  
  <rect width="250" height="120" x="0" y="0" fill="url(#g1)"/>  
</svg>
```



RADIÁLNÍ GRADIENTY

```
<svg width="250" height="120" >
  <defs>
    <radialGradient id="g2" cx="10%" cy="10%" r="100%">
      <stop stop-color="red" offset="0%" />
      <stop stop-color="orange" offset="50%" />
    </radialGradient>
  </defs>
  <rect x="0" y="0" width="250" height="120" fill="url(#g2)" />
</svg>
```



ÚLOHA 1



Umožňují změnu chování objektu

GAUSOVSKÉ ROZOSTŘENÍ (GAUSSIAN BLUR)

```
<svg width="250" height="120" style="background-color:white">
  <defs>
    <filter id="f1" width="200%" height="200%" x="-50%" y="-50%">
      <feGaussianBlur in="SourceGraphic" stdDeviation="15"/>
    </filter>
  </defs>
  <rect width="100" height="30" x="25" y="25" fill="red"
    filter="url(#f1)"/>
</svg>
```



EMBEDDED/INLINED SVG FILTERS

```
<html>
  <body>
    <svg xmlns="http://www.w3.org/2000/svg">
      <filter id="waves" x="-20%" y="-20%" width="140%" height="140%"
        filterUnits="objectBoundingBox" primitiveUnits="userSpaceOnUse"
        color-interpolation-filters="linearRGB">
        <feTurbulence type="turbulence" baseFrequency="0.01 0.01"
          numOctaves="1" seed="1" stitchTiles="noStitch"
          result="turbulence"/>
        <feDisplacementMap in="SourceGraphic" in2="turbulence" scale="20"
          xChannelSelector="G" yChannelSelector="A"
          result="displacementMap"/>
      </filter>
    </svg>

    
  </body>
</html>
```

EMBEDDED/INLINED SVG FILTERS

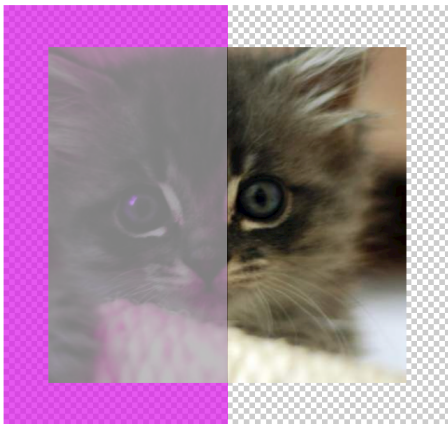
```
img {  
  /* inline the SVG filter */  
  filter: url('data:image/svg+xml,\n    <svg xmlns="http://www.w3.org/2000/svg">\n      <filter id="waves" x="-20%" y="-20%" width="140%" height="140%"  
      filterUnits="objectBoundingBox" primitiveUnits="userSpaceOnUse"  
      color-interpolation-filters="linearRGB">\n        <feTurbulence type="turbulence" baseFrequency="0.01 0.01"  
        numOctaves="1" seed="1" stitchTiles="noStitch" result="turbulence" />\n        <feDisplacementMap in="SourceGraphic" in2="turbulence" scale="20"  
        xChannelSelector="G" yChannelSelector="A" result="displacementMap" />\n      </filter>\n    </svg>#waves');  
}
```

PŘEHLED FILTRŮ V SVG

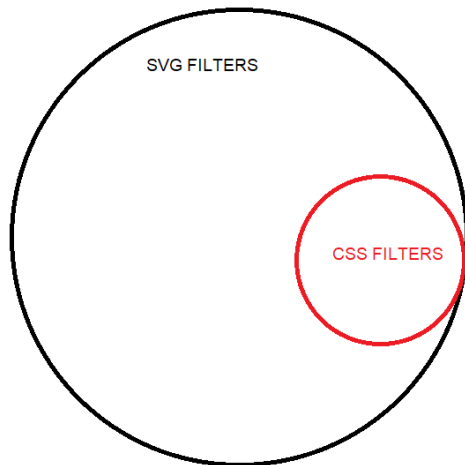
<https://www.w3.org/TR/filter-effects/>

<https://yoksel.github.io/svg-filters/#/docs/blur>

ÚLOHA 2



CSS FILTRE



```
/* URL to SVG filter */  
filter: url("filters.svg#filter-id");  
  
/* <filter-function> values */  
filter: blur(5px);  
filter: brightness(0.4);  
filter: contrast(200%);  
filter: drop-shadow(16px 16px 20px blue);  
filter: grayscale(50%);  
filter: hue-rotate(90deg);  
filter: invert(75%);  
filter: opacity(25%);  
filter: saturate(30%);  
filter: sepia(60%);  
  
/* Multiple filters */  
filter: contrast(175%) brightness(3%);  
  
/* Use no filter */  
filter: none;  
  
/* Global values */  
filter: inherit;  
filter: initial;  
filter: unset;
```

SVG, JS – PŘIDÁVÁNÍ PRVKŮ

```
<svg id="testsvg"></svg>
```

```
const svg = document.getElementById('testsvg');  
const xmlns = "http://www.w3.org/2000/svg";  
  
const newElement = document.createElementNS(xmlns, 'rect');  
  
newElement.setAttribute("x", "10");  
newElement.setAttribute("y", "10");  
newElement.setAttribute("width", "100");  
newElement.setAttribute("height", "100");  
newElement.style.stroke = "#000";  
newElement.style.strokeWidth = "5px";  
newElement.style.fill = "#f00";  
svg.appendChild(newElement);
```


SVG, JS – PŘIDÁVÁNÍ PRVKŮ

```
<svg >  
  <g id="g1"></g>  
</svg>
```

```
const GROUP = document.getElementById('g1');  
const xmlns = "http://www.w3.org/2000/svg";  
  
const newElement = document.createElementNS(xmlns, 'path');  
  
newElement.setAttribute("d", "M 10 10 L 50 50 100 50");  
newElement.style.stroke = "#000";  
newElement.style.strokeWidth = "5px";  
newElement.style.fill = "#f00";  
GROUP.appendChild(newElement);
```

Díky za pozornost!