



Responsive Web Design

INF5750/9750 - Lecture 6 (Part III)

Problem Area

- Different types of devices are used to access the WWW, but we want to use the same HTML code
- Flexibly adjust layout, content, scale images etc
- Devices also have different capabilities
- You also want to use the same content for different purposes i.e. web viewing, printing, presentations
- Instead of needs for a desktop Web version with most common screen resolutions, and a particular mobile version, the idea is to approach the issue the other way around: use flexible and fluid layouts that adapt to almost any screen.

Responsive Web Design (RWD)

- Three key technical features are the heart of responsive Web design:
 - Media queries and media query listeners
 - A flexible grid-based layout that uses relative sizing
 - Flexible images and media, through dynamic resizing or CSS
- Responsive websites **respond** to their environment



Media Queries

- There are three ways to implement media queries:
 - Use @import to import style rules from other style sheets

```
@import url(style600min.css) screen and (min-width: 600px);
```

- Put media queries directly in the style sheet

```
#nav { float: right; }
#nav ul { list-style: none; }
@media screen and (min-width: 400px) and (orientation: portrait) {
  #nav li { float: right; margin: 0 0 0 .5em; border: 1px solid #000000; }
}
@media screen and (min-width: 800px) {
  #nav { width: 200px; }
  #nav li { float: left; margin: 0 0 0 .5em; border: none; }
}
```

- Include a query in a linked style sheet's media attribute

```
<link rel="stylesheet" type="text/css" media="screen and (max-device-width: 800px)"
href="style800.css" />
```

- How to test? To get the real resolution use viewports

```
<meta name="viewport" content="width=device-width">
```

CSS + JS = Media Query Listeners

- Because of the (cascading) nature of CSS, default styles are defined at the top with the media query matching rules and styles below
- Styles defined at the top will be cascaded to the matching styles in the rule, or even completely overwritten
- Listeners are useful to monitor changes and respond

```
// media query event handler
if (matchMedia) {
  var mq = window.matchMedia("(min-width: 500px)");
  mq.addListener(WidthChange); WidthChange(mq);
}

// media query change
function WidthChange(mq) {
  if (mq.matches) {
    // Download normal images since window width is at least 500px
  } else {
    // Download scaled smaller images since window width is less than 500px
  }
}
```

Flexible Grids (Lots of math)

- A flexible grid-based layout is one of the cornerstones of responsive design
- Using CSS for positioning and for laying out margins and spacing
- Stop using pixel-based layouts and start using percentages or the em for sizing, the formula for calculating the em:
 - $\text{target} \div \text{context} = \text{result}$
- Normal context for the body font size is 16 pixels
- If the designer specifies that the h1 should be 24 pixels, you can calculate the following: $24 \div 16 = 1.5$

This results in the following CSS style:

```
h1{ font-size: 1.5em; }
```

CSS Grid (Grid Alignment)

- start by setting the display block to 'grid'
- column layouts using standard CSS3

```
<div class="wrapper">  
  <article class="main">My awesome content here</article>  
  <footer class="footer">Some informations here</footer>  
  <header class="header">My site title goes here</header>  
  <aside class="sidebar">Here is my side content</aside>  
  <aside class="annexe">Some more side content</aside>  
</div>
```

```
.wrapper { display: grid; grid-columns: 200px 15px 1fr 15px 100px; grid-rows: (auto 15px)[2] auto; }  
.header, .footer { grid-column-span: 5; }  
.sidebar, .main, .annexe { grid-row: 3; }  
.header { grid-row: 1; }  
.footer { grid-row: 5; }  
.sidebar { grid-column: 1; }  
.main { grid-column: 3; }  
.annexe { grid-column: 5; }
```

On small screen width

Hello world

Lorem Ipsum section 1

Phasellus venenatis sem vel velit tincidunt tincidunt. Curabitur gravida, ante sit amet fringilla auctor, dolor tellus elementum sapien, eu laoreet erat orci pellentesque nisi. Proin nisi nisl, tempus vel fringilla at, cursus viverra nunc. Pellentesque sit amet velit enim, at accumsan tortor. Nam id dui sagittis neque elementum laoreet at at metus. Nunc placerat sagittis mauris, nec blandit nibh convallis eu. Duis a felis nunc.

Lorem Ipsum section 2

Nam tempus justo eu massa ultrices eget imperdiet ligula placerat. Suspendisse id lectus turpis, sit amet sollicitudin purus. Integer ut ante facilisis est blandit fermentum. Nulla facilisi. Integer magna risus, viverra eget blandit bibendum, iaculis sit amet quam. Mauris pretium, mi fermentum consectetur egestas, orci nibh suscipit tellus, dignissim eleifend nisl leo quis velit. Donec sed dui quis ipsum molestie vestibulum eget sed lorem. Mauris hendrerit magna ut leo rutrum vel luctus tellus convallis.

Lorem Ipsum section 3

- Curabitur ultrices tristique purus, sed pellentesque magna scelerisque ut.

On large screen width

Hello world

Lorem Ipsum section 1

Phasellus venenatis sem vel velit tincidunt tincidunt. Curabitur gravida, ante sit amet fringilla auctor, dolor tellus elementum sapien, eu laoreet erat orci pellentesque nisi. Proin nisi nisl, tempus vel fringilla at, cursus viverra nunc. Pellentesque sit amet velit enim, at accumsan tortor. Nam id dui sagittis neque elementum laoreet at at metus. Nunc placerat sagittis mauris, nec blandit nibh convallis eu. Duis a felis nunc.

Lorem Ipsum section 2

Nam tempus justo eu massa ultrices eget imperdiet ligula placerat. Suspendisse id lectus turpis, sit amet sollicitudin purus. Integer ut ante facilisis est blandit fermentum. Nulla facilisi. Integer magna risus, viverra eget blandit bibendum, iaculis sit amet quam. Mauris pretium, mi fermentum consectetur egestas, orci nibh suscipit tellus, dignissim eleifend nisl leo quis velit. Donec sed dui quis ipsum molestie vestibulum eget sed lorem. Mauris hendrerit magna ut leo rutrum vel luctus tellus convallis.

Lorem Ipsum section 3

- Curabitur ultrices tristique purus, sed pellentesque magna scelerisque ut.
- Curabitur sodales mauris et turpis imperdiet ultricies.

Resources

- A Book Apart – Responsive Web Design
 - <http://www.abookapart.com/products/responsive-web-design>
- Media Queries, W3C
 - <http://www.w3.org/TR/css3-mediaqueries/>
- Responsive Web Design, MSDN Magazine
 - <http://msdn.microsoft.com/en-us/magazine/hh653584.aspx>