

Introduction to SMIL 2

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Previous Lecture

- Introduction to W3C and XML
- Introduction to SMIL
- Writing a SMIL file
- Adding Media Objects
- Clipping media files
- Timing and Synchronising
- Layout

Today's Lecture

- More about layout and regions
- Animation
- User Interaction
- Providing metadata for you presentation
- Examples of SMIL in action

Naming Convention SMIL

- SMIL DOM follows HTML DOM
- Names are one or more English words concatenated into a single string
- A property or method name starts with the initial keyword in lowercase, and each subsequent word starts with a capital letter

Region and Layout

- We have seen how to declare regions and a layout
- Region describes a rectangular area of your SMIL file
- Layout groups a number of regions together
- But how do we use them?

Region and Layout

```
<head>
<layout>
  <region id="half-center" left="25%"
    top="25%" width="50%" height="50%"/>
</layout>
</head>
<body>
  
</body>
```

Region and Layout

- What happens if size of region and media do not match
- By default media starts in top left corner, remaining space is in background colour
- If object doesn't fit it isn't rendered
- There are a number of fit values that can be used to ensure that an object fits a region

Region and Layout

Fit values can be used to ensure that a media object fits into a region, these include

- Slice
- Scroll
- Fill
- Meet

Region and Layout

As we have seen with other attributes it is possible to nest regions in SMIL

```
<region id="two-column" width="100%" height="100%">
  <region id="column1" left="0%" top="0%" width="50%" height="100%" />
  <region id="column2" left="50%" top="0%" width="50%" height="100%" />
</region>
```

Region and Layout

- Other than 3-D media objects SMIL does not have many 3-D capabilities
- Child regions are rendered on top of ancestor regions
- It is possible to override this using z-index
- If object have the same z-index, the object created later will have a higher position

Region and Layout Example

- Going to create a presentation which looks like picture-in-picture television
- Going to use two video sources
- One will occupy the entire screen
- The other will be displayed in the bottom right corner

Region and Layout Example

```
<layout>
  <topLayout width="400px" height="300px">
    <region id="main-video" left="0%" top="0%" width="100%" height="100%">
      <region id="corner-video" left="75%" top="75%" width="25%" height="25%" fit="scale" soundLevel="0%" />
    </region>
  </topLayout>
</layout>
```

Region and Layout Example

```
<par>  
  <video id="big-video" src="big.mpg"  
    alt="our big video" region="main-video"/>  
  
  <video id="small-video" src="small.mpg"  
    alt="our small video" region="corner-  
    video" end="big-video.end"/>  
</par>
```

Region and Layout Example

- Didn't need any special software
- We can easily change the layout, i.e. size and position
- Don't need to know the size or duration of the files
- The files don't have to be on our server or machines

User Interaction

- SMIL provides a number of different methods for interacting with users
- We will cover basics of hyper linking and click events
- Most of this uses the anchor elements that are available

User Interaction

- Can use the <a> element just like in HTML
- As in html it has the attribute href which contains the target URI of the link
- SMIL contains <a> by adding a number of attributes that are unique to SMIL
- Can also add alt information to <a>

User Interaction

The unique attributes include:

- Show
- Target
- External
- destinationPlaystate
- sourcePlaystate
 - Play
 - Stop
 - pause

User Interaction

The unique attributes include:

- accesskey
- tabIndex
- sourceLevel
- destinationLevel
- actuate

User Interaction

```
<a href="http://www.w3.org/" alt="the World Wide
Web Consortium">
  <text src="w3.txt" alt="a brief of the W3C"/>
</a>

<a href="second.smil" alt="the next presentation in
the series" show="replace">
  <animation src="credits.svg" alt="the
names of the makers of this presentation"/>
</a>
```

User Interaction

```
<a href="pause.smil" alt="simple animated
pause loop" show="new"
sourcePlaystate="pause" accesskey="p">

  

</a>
```


User Interaction

- Possible to divide up media objects to link to more than one target
- You can divide the object spatially or temporally
- To divide the object spatially use the `<area>` element
- `<area>` takes the same attributes as `<a>`, plus shape and coords

User Interaction

```
<video src="ads.mpg" alt="a series of ads"
dur="01:30">
  <area href=http://ad1.com/ begin="00:00"
end="00:30"/>
  <area href=http://ad2.com/ begin="00:30"
end="01:00"/>
  <area href=http://ad3.com/ begin="01:00"
end="01:30"/>
</video>
```

User Interaction

- SMIL presentations can behave like GUIs if the appropriate events are handled
- SMIL only specifies three events
- It is not mandatory for players to handle these events
- The events are
 - .beginEvent
 - .endEvent
 - .repeat

User Interaction

- Mainly use the `<a>` element just like in HTML
- However SMIL provides some additional attributes
- It is possible to divide a media object into more than one target link
- SMIL can handle some user click events

Animation

- It is possible to animate media objects in SMIL
- Animation in SMIL requires a lot of maths
- Using a dedicated editor can alleviate this problem
- Animation elements are nested within the media object they are animating
- We are going to use the BasicAnimation module

Animation

The four animation elements in SMIL are:

- <animate>
- <animateMotion>
- <animateColor>
- <set>

Each element animates it's parent object by manipulating the parent objects attributes

Animation

In addition to the timing attributes, animations have a number of other attributes

- attributeName
- targetElement
- from,to and by
- values
- calcMode

Animation

Animation for pot falling from window sill

```
<video src="pot.mpg" alt="flower pot">  
  <animateMotion values="0,0; 0,9;  
    0,27; 0,54" calcMode="linear"  
    dur="4s"/>  
</video>
```

Animation

TV set turning off straight away

```
<video src="television.mpg"
alt="television">
  <set attributeName="width" to="0"
begin="5s" dur="indefinite"/>
  <set attributeName="height" to="0"
begin="5s" dur="indefinite"/>
</video>
```

Animation

Can use more than one animation on single object

```
<video src="television.mpg" alt="the news">
  <animateMotion values="0,0; 0,3; 0,0; 0,7;
0,0" dur="1s" repeatDur="indefinite"/>
  <animateMotion values="0,0; 4,0; 0,0"
dur="2s" repeatDur="indefinite"/>
</video>
```

Animation

Animation for a TV screen fading to black

```
<video src="television.mpg" alt="bright
television">
  <animateColor to="#000000"
dur="10s"/>
</video>
```

Animation

- It is possible to animate media objects in SMIL
- Animation elements are nested within the media object they are animating
- The change the value of attributes to cause the animation
- This can happen over a duration of time and/or a set of values