

SMIL

(Synchronised Multimedia Integration Language):

A guide for language teachers

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Notes to Version 2:

This updated version corrects a few minor errors that crept into the first version (such as `
` which should have read `
` in several cases) and also adds paragraphs 5.4 onwards, which reflect some of the new features available in SMIL version 2.0

Notes to Version 1:

This short guide is based on work I researched during my study for the Certificate in Humanities Computing for Languages (which I passed with distinction) at Cambridge University in 2002.

Thanks to Gavin Burnage, Head of the CALL Facility in the Faculty of Modern and Medieval Languages at Cambridge University for directing me to SMIL and telling me to find out about it for him!

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1. What is SMIL?

Firstly, SMIL is pronounced 'smile'. It is a sort of programming language which was approved by the W3C, the body which controls languages used on the internet, in 2001 and as such is a very new language.

The purpose of SMIL is to allow different types of media (video, audio and text, for example) to be simultaneously delivered to a computer on a network such as the internet and simultaneously played.

SMIL is an XML-compatible language: that is to say it follows the syntax rules that are the basis of almost every page designed for the internet. (NB: This assumes that most web-pages are now written in XHTML1, as per the W3C's recommendation. In actual fact, most designers still use the older HTML4 language which is almost, but not quite, XML-compatible.)

2. How can this be used for language teaching?

Linguists are only just starting to realise the potentials of SMIL for language teaching. Most schools and almost every University have internal networks and these are perfect for delivering high-quality video and audio. Thus, we can design a system to deliver video programmes in the Target Language to individual computers. This is a far more satisfactory solution than the old situation where a teacher stands in front of the class with a cassette-player, since, on a computer, the student can rewind, fast forward and pause his / her personal copy at will and see relevant images at the same time.

With SMIL we could deliver a video (which might be captured from a foreign television station, with the necessary permission) and allow the student to choose whether they want to listen to the video in the original language or a translation, with or without subtitles explaining difficult words as they occur, a transcription of the full text or even a short summary of the passage:

3. An example:



In this case (based on some work I did in Cambridge in 2002), we see the normal RealPlayer window. There are several ‘regions’ defined in the window, each containing a different type of information. The largest region shows a video and a smaller region under this can display a subtitle. To the right of this, we have a scrolling text-stream. Along the bottom row we have the video’s title, and three flag pictures which are all links. To the right of these, we have a text-based hyperlink. Clicking on this hyperlink will cause RealOne Internet Explorer (actually Microsoft Internet Explorer with a RealPlayer skin) to load and display the webpage. Clicking on the flags causes the whole SMIL presentation to re-load with the audio in the appropriate language. This is an important point: we have separated the video from the audio, so only the audio stream needs to be changed when the language is changed: the video itself stays the same.

4. Why RealPlayer?

Because SMIL is so new! It is sort-of understood by Windows Media Player, but as yet Microsoft is dragging their feet on implementing this standard. Consequently, SMIL is only realistic if you know your audience (your pupils) all have access to RealPlayer 8 or later (and yes, RealOne is later than version 8!). In brief, RealPlayer has far more support for SMIL and so, for example, streaming text will not yet work in Windows Media Player.

5. How do you create a SMIL document?

As yet there are no fully-featured reliable SMIL authoring programmes, so we have to write the code ourselves. Remember, however, that once written, it can be reused for other videos. It would be inappropriate to produce a full tutorial here, but I have worked through a simplification of the screenshot above to show you the basics. A quick Google search on 'SMIL' will produce further information and I especially recommend the guides on the official W3C and RealNetworks websites.

5.1 *Creating a link to a SMIL document*

There is another minor problem with SMIL at present which should be removed in the near future. I have already described SMIL as XML-compatible. This means that the file contents are identified to web-browsers as text/xml. Internet Explorer and other browsers are meant to be able to view XML content and so they will try to load the presentation as code if we just create a link on a webpage like:

```
<a href="myvideo.smil">My video</a>
```

We can workaroud this, however, by taking advantage of RealPlayer .ram files. Instead of the above, create the link to:

```
<a href="myvideo.ram">My video</a>
```

and then create a plain text document in Notepad containing just the absolute path to your video. For example:

```
http://www.myserver.tld/directory/myvideo.smil
```

This file can then be saved as myvideo.ram. The result is that when you click on the link, the .ram file is identified as a file type to be loaded in RealPlayer and then RealPlayer can in turn load the SMIL file.

5.2 The SMIL file for video and multiple audio versions

A SMIL file is just a simple text file which has two halves. In the header we put the details of the regions we want to define in the window and then in the body we say which files we want to play in those regions:

```
<smil>
  <head>
    <meta name="copyright" content="Dominic Smith, 2002"/>
    <layout>
      <root-layout width="450" height="245" background-
color="white"/>
      <region id="video" left="10" top="10" width="240"
height="180" fit="fill"/>
      <region id="audio" left="1" top="1" width="0" height="0"/>
      <region id="trans" left="260" height="180" top="10"
width="180"/>
      <region id="capt" left="10" top="195" width="100"
height="40" fit="fill"/>
      <region id="lang_fr" left="130" top="205" width="20"
height="20" fit="fill"/>
      <region id="lang_es" left="160" top="205" width="20"
height="20" fit="fill"/>
      <region id="lang_uk" left="190" top="205" width="20"
height="20" fit="fill"/>
      <region id="script" left="220" top="205" width="20"
height="20" fit="fill"/>
    </layout>
  </head>
```

Here we have specified that the main window should be 450x250 pixels large and with a white background colour. We have then defined that the video should be 280x180 pixels, 10 pixels down from the top of the window and 10 pixels in from the left of the window. The picture should be forced to fill the available space.

Equally, we specify a region called 'audio' which is 0 pixels big. It is important to note that the audio has to be 'placed' somewhere, even though it will not be seen.

In the body section, we then specify which files we want to play in these regions. The key tag used below is <par>, meaning that the files contained between the <par> tags will be played in parallel, that is to say simultaneously. We could also have specified <seq> (Sequential) or used a mixture of these:

```
<body>
  <par>
    <video src="call.rm" region="video" alt="video" id="vid"/>
    <audio src="call_es.rm" region="audio" id="sound"/>
    
    <a href="http://thor.cam.ac.uk/~dnas2/e-
lit/video/dnas2/call_fr.smi" show="replace">
    </a>
    <a href="http://thor.cam.ac.uk/~dnas2/e-
lit/video/dnas2/call_es.smi" show="replace">
```

```
</a>
<a href="http://thor.cam.ac.uk/~dnas2/e-
lit/video/dnas2/call_uk.smi" show="replace">
</a>
</par>
</body>
</smil>
```

And that's it!

We see on the first few lines how we have specified that the file 'call.rm' (a silent video) should be played in the 'video' region, at the same time as the file 'call_es.rm' is played in the audio region.

Note that we can add pictures (gifs) and hypertext links exactly as we would do in XHTML, although pictures have to have a duration set. In this case, the picture will be displayed for 75 seconds, which is exactly the length of the video. The `show="replace"` attribute to the hyperlinks means that, if the picture is clicked, the current SMIL presentation will be stopped, closed and the new SMIL file will be played automatically.

The call_fr.smi file is identical to the above, except that it specifies

```
<audio src="call_es.rm" region="audio" id="sound"/>
```

instead, so making it seem as though the video is in French.

5.3 Adding streaming text

We can add a textstream (such as a scrolling transcript), too. We have already provided for this in the definition of the regions above: the region is called ‘trans’. In the body of our SMIL file we just add:

```
<textstream src="call_uk.rt" region="trans" alt="Transcript"
id="transcr"/>
```

This, of course, inserts the contents of call_uk.rt in the ‘trans’ region.

.rt stands for RealText and is part of the RealNetwork’s definition of SMIL which goes beyond the current W3C recommendation, although it may well be included in a future version.

The .rt file format is essentially the same as XHTML but you should note that spaces should not be put before slashes when closing tags such as
. The RealNetworks website details other differences, such as the fact that will produce an indented but not bulleted list.

```
<window type="scrollingnews" duration="75" bgcolor="#0000ff">
<font face="Arial" size="2" color="#ffffff">
<hr/>
<p>
<b>TRANSCRIPT</b>
<br/>Welcome to the CALL room.
<br/>CALL is an English acronym
<br/>for <i>Computer Assisted
<br/>Language Learning</i>, and
<br/>the resources in this room
<br/>are invaluable for helping
<br/>students to learn
<br/>languages.
<br/>
</p>
```

Note that here again, we need to specify the duration of the text as 75 seconds. We state a blue background with white text using the standard hexadecimal numbers of these colours. It does take some trial and error to get the line length just right and to ensure that enough lines are left to make the text appear together with the speech, but I assure you that you can get it to work.

5.4 Subtitling

NB: To use this feature, you need to ensure that RealOne uses SMIL version 2, not version 1 of the language, which is the default. To do this, include the following Document Type Declaration in place of `<smil>` at the start of the SMIL file.

```
<smil xmlns="http://www.w3.org/2001/SMIL20/Language">
```

SMIL version 2.0 allows you to stack regions on top of each other. This might be useful if subtitling a film, so you can put the subtitles on top of the film. Unless otherwise specified with a `backgroundColor` (not `backgroundcolor` in version 2.0!) attribute, all overlapping regions are transparent by default.

In order to define what order the layers should be stacked in, we use the `z-index` attribute. In this case, therefore, the video region definition in the `<head>` of the SMIL file will include the attribute `z-index="0"`, while the subtitle region will have `z-index="1"`, thus putting the subtitles on top of the video.

To define when some given RealText should display, we use the `<time/>` and `<clear/>` tags as follows (taken from a test set of subtitles I designed for the Argentinean song *Por lo que yo te quiero* by Walter Olmos):

```
<window duration="291" bgcolor="#555555">
<font face="Arial" size="4" color="ffffff"><strong><center>
<time end="5"/>POR LO QUE YO TE QUIERO<br/>Walter Olmos
<time begin="25"/><clear/>No sabes lo que es
<time begin="28"/><clear/>tener que andar así:
<time begin="31"/><clear/>robándote los momentos
<time begin="35"/><clear/>cansándome de finger,
<time begin="39"/><clear/>callando mis sentimientos
<time begin="42" end="45"/><clear/>amándote para mi
</center></strong></font>
</window>
```

Note that you cannot (yet) use standard entity values in RealText: accents must be entered directly from the keyboard as á and not `´`;, for example. You will also note that there is no `type=scrollingnews` attribute to `<window>`, thus meaning that the text doesn't scroll as it did in paragraph 5.3.

5.5 Defining the start point, end point and length of a medium

Let's imagine we have recorded a 30 minute TV programme, but we only need to use five minutes in our SMIL file. We do not need to re-edit the video file to shorten it. Instead, include the SMIL version 2.0 attributes as follows. (Again, you will need to include the Declaration shown in paragraph 5.4 to use these) To start a clip five seconds in from the beginning and to end it four seconds later, we use:

```
startClip="5s" dur="4s"
```

as attributes of the `<video src>` tag. We might also re-write this as:

```
startClip="5s" endClip="9s"
```

which will have an identical effect.

5.6 Changing the volume

Now let's imagine that a teacher wanted to dub a film by reducing the volume of the video and playing a separate audio file louder over the top. This is also possible in SMIL version 2.0 (ie add the declaration in paragraph 5.4 first). In our definition of the video region in the `<head>` of the SMIL file, we include the attribute `soundLevel="15%"`, which will play the video with the audio reduced to 15% of the recorded sound level. In the audio region, we define `soundLevel="100%"`, which will play the audio at the recorded level. We could even specify 120% or more if necessary.

6. Conclusion

So, is SMIL suitable for language teaching? The answer would have to be yes. The features I have described here have been described so quickly as not to do them justice. Furthermore, there are many features in SMIL that I have not described at all, such as the ability to turn part of a video picture into a link for a few seconds, or the ability to display a normal webpage alongside some audio and/or video.

Nevertheless, more work needs to be done. Firstly, we need video-editing software which will create the necessary SMIL files for us and help us to do the layouts and create links in an easy, intuitive, and WYSIWYG (what you see is what you get) manner. Some people have started to work on this but none have yet fully achieved it. (Again, a quick search on the internet will reveal further information).

We also need better acceptance of SMIL. Firstly, despite Microsoft's harsh comments about SMIL (which imply that the company will refuse to adopt the technology on any significant scale), the next version of Windows Media Player must not fail to include full support of the W3C standard as a minimum and preferably adopt some of the RealNetworks technologies (such as RealText), too.

The W3C also needs to keep a close eye on SMIL since diverging standards between RealNetworks and Microsoft could be a greater disaster than the numerous proprietary versions of HTML that the web suffered from in the 1990s (and, to an extent, still suffers from today).

Equally, we need better integration of media plug-ins in browsers. Imagine if we could watch a video in a webpage simply due to a SMIL file and have it work on any browser under any platform (rather than a nasty MicroSoft ActiveX control in Internet Explorer.) The technology is there if the developers want to take advantage of it.

In the meantime, for those of us interested in using SMIL, we have to have the time and basic skills to create XML-compliant pages from using nothing but text-editors and that isn't part of a teacher's job-description.

In one word, I'd say that SMIL is potentially useful for language teaching but currently only accessible to the very enthusiastic few.

Good luck!

For further, more detailed, information, see the RealNetworks SMIL for RealOne developer website:

<http://service.real.com/help/library/guides/realone/ProductionGuide/HTML/realpgd.htm>