



# CREATING A SPEECHWEB APPLICATION

**SpeechWeb Developers Manual Version 01/08**

This manual has been written to help developers create a SpeechWeb application (in Miranda in this version)

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# INTRODUCTION

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The Public-Domain SpeechWeb is a web of speech accessible applications created by faculty and students at the School of Computer Science at the University of Windsor. The SpeechWeb is based on a novel architecture invented by Dr. Richard Frost, and described in the paper “Call for a Public-Domain SpeechWeb” Commun. ACM 48(11): 45-49 (2005)

[http://davinci.newcs.uwindsor.ca/~richard/speechweb\\_papers/CACM\\_SpeechWeb.pdf](http://davinci.newcs.uwindsor.ca/~richard/speechweb_papers/CACM_SpeechWeb.pdf)

This manual explains how to create and deploy your own speech applications.

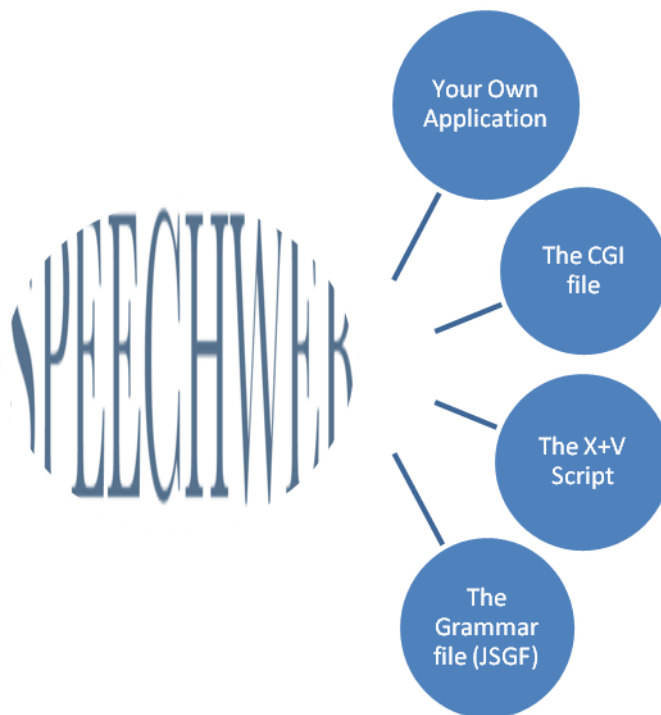
You should begin by installing the Opera browser, downloading the IBM speech recognition plugin for Opera, and then using Opera to access an existing SpeechWeb application. The instructions on how to do this are given in the following paper: Richard A. Frost, Xiaoli Ma, Yue Shi A browser for a public-domain SpeechWeb. WWW 2007: 1307-1308

[http://davinci.newcs.uwindsor.ca/~richard/speechweb\\_papers/WWW\\_2007.pdf](http://davinci.newcs.uwindsor.ca/~richard/speechweb_papers/WWW_2007.pdf)

After experimenting with existing SpeechWeb applications, you are ready to create your own application.

# CREATING A SPEECHWEB APPLICATION

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## ***Instructions***

We assume that you will use a UNIX server for your application, which will be written in Miranda. We will show later how to use other servers and programming languages.

- A) Create a directory called “public\_html” in your home directory on the School of Computer Science Solaris server (or another server which supports the CGI web communications protocol). This how to create the directory:

Open Files manager > Click on file > New folder > rename it to public\_html

To make the public\_html directory accessible by others:

Right click on public\_html > properties > Change the Permission mode to 755,

Or select the following after clicking on the public\_html directory icon:

Permissions:	Read	Write	Execute
Owner:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Group:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Permission mode:	<input type="text" value="755"/>		

B) Inside the `public_html` directory, you need to create a new directory and rename it with the name of your application. For example, in this manual, we shall refer to this directory as *"name\_of\_your\_application"*.

You need to change the Permission mode to 755 for this directory.

C) Inside *"name\_of\_your\_application"*, you will need to add four files. To make this easy, you can copy four files from the existing application "judy" and then modify them for your own application as follows:

### 1. The cgi executable

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Go to the following link:

[http://cs.uwindsor.ca/~speechweb/p\\_d\\_speechweb/judy/judy.demo](http://cs.uwindsor.ca/~speechweb/p_d_speechweb/judy/judy.demo)

You will get the `.cgi` file for judy's SpeechWeb application:

```
#!/bin/csh -f

setenv HOME '/fac3/speechweb/public_html/p_d_speechweb/judy'
setenv PATH '/global/apps/mira/bin:$PATH'

echo "Content-Type:text/plain"
echo ''

setenv v "`/bin/cat`"
/global/apps/mira/bin/mira /fac3/speechweb/public_html/p_d_speechweb/judy/judy.m << zzz
(sh_answer "$v")
/q
zzz
```

You need to copy the contents of this file into a text editor, save it in the directory *"name\_of\_your\_application"* and rename it as `name_of_your_application.cgi` (Make sure that the contents of the page were copied into the text editor in the same order they are and that there was no new characters added to the file such as a new line. It is best to copy this file using the UNIX system rather than through a PC which can add new characters))

Now, after you have created your own CGI file, you need to change some of the contents to make it work with your own application:

On line 3, change: `'/fac3/speechweb/public_html/p_d_speechweb/judy'`

To: `'/stu<stu_num>/<your_user_name>/public_html/name_of_your_application'`

`<stu_num>` is the number of the stu directory your account is in. You can find it on the top of the file manager:



In this example, it is `stu2`.

`<your_user_name>` is your Uwindson user name you use to log on to a sun terminal.

`<name_of_your_application>` is the directory we have created in part B).

For example, the full path name would be something like the following:

`'/stu2/karabi/public_html/name_of_your_application'`

**\*\*On line 11, change:**

`/global/apps/mira/bin/mira /fac3/speechweb/public_html/p_d_speechweb/judy/judy.m`

To:

`/global/apps/mira/bin/mira  
'/stu<stu_num>/<your_user_name>/public_html/name_of_your_application  
'<name_of_your_application.m>`

`<name_of_your_application.m>` will be the name of your own application.

Now, save the `.cgi` file and close it.

Finally, change the Permission mode to `755` for the `.cgi` file.

**\*\*Note:** The change above works only with applications written in Miranda.

## 2. The X+V script

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Open the link: [http://cs.uwindsor.ca/~speechweb/p\\_d\\_speechweb/judy/judy.xml](http://cs.uwindsor.ca/~speechweb/p_d_speechweb/judy/judy.xml)

If you are using a browser other than Opera you will get an error page:

### XML Parsing Error: undefined entity

Location: [http://cs.uwindsor.ca/~speechweb/p\\_d\\_speechweb/judy/judy.xml](http://cs.uwindsor.ca/~speechweb/p_d_speechweb/judy/judy.xml)

Line Number 379, Column 49:

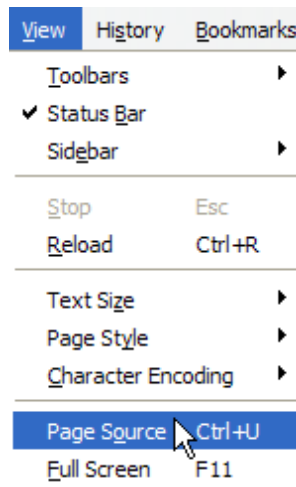
```
objTable.rows[0].cells[0].innerHTML = "<br/>&nbsp;";
```

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That's fine, because you only need the source code of the page.

Just copy the source code into a text editor, save it to "*name\_of\_your\_application*" and rename it as *name\_of\_your\_application.xml*.

This is how to find the source code:



There are two main changes you need to make in the xml file:

1. On line 23:

Change: `http://luna.cs.uwindsor.ca/~speechweb/p_d_speechweb/judy/judy.cgi`;

To: `"http://cs.uwindsor.ca/~<your_user_name>/name_of_your_application/  
<name_of_your_application.cgi>"`;

`<name_of_your_application.cgi>` is the name you gave to your cgi file.

2. On line 30:

Change: `src="http://luna.cs.uwindsor.ca/~speechweb/p_d_speechweb/judy/judy.jsgf"`

To: `"http://cs.uwindsor.ca/~<your_user_name>/name_of_your_application/  
name_of_your_application.jsgf"`

`<name_of_your_application.jsgf>` is the name of your grammar file.

Now, save the .xml file and close it.

Finally, change the Permission mode to 755 for the .xml file.

### **3. The grammar file:**

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You need to create a grammar file and add it to “name\_of\_your\_application”. The name of your grammar file must be name\_of\_your\_application.jsgf.

JSGF is the Java Speech Grammar Format which is a language that you can use in order to write an attribute grammar for your application. (Refer to “Useful links” to see some examples).

### **4. Your application:**

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Add your application to “name\_of\_your\_application” and make the following change:

The CGI communication protocol will add 9 characters to the input to the speechweb browser, before sending it to your application. In order to get your application to work properly, you need to drop these 9 characters from the input. For example, if the name of the Miranda function that processes the input is called “answer”, then add the following to the end of your Miranda program:

```
sh_answer x = answer (drop 9 x)
```

Note that sh\_answer is the function that is called by the .cgi script.

## D) Useful links:

- ✓ The SpeechWeb website:  
[http://sol.cs.uwindsor.ca/~speechweb/p\\_d\\_speechweb/index.html](http://sol.cs.uwindsor.ca/~speechweb/p_d_speechweb/index.html)
- ✓ Attribute grammars written using JSGF:
  - Simple grammar:  
[http://luna.cs.uwindsor.ca/~speechweb/p\\_d\\_speechweb/judy/judy.jsgf](http://luna.cs.uwindsor.ca/~speechweb/p_d_speechweb/judy/judy.jsgf)
  - More complex grammar:  
<http://luna.cs.uwindsor.ca/~karabi/ask/ask.jsgf>
- ✓ Applications written using Miranda:
  - Simple application:  
[http://luna.cs.uwindsor.ca/~speechweb/p\\_d\\_speechweb/judy/judy.m](http://luna.cs.uwindsor.ca/~speechweb/p_d_speechweb/judy/judy.m)
  - More complex application:  
<http://luna.cs.uwindsor.ca/~karabi/ask/ask.m>
- ✓ Grammar Format Specification (JSGF):  
<http://java.sun.com/products/java-media/speech/forDevelopers/JSGF/JSGF.html#11803>
- ✓ Any suggestions can be forwarded to: [karabi@uwindsor.ca](mailto:karabi@uwindsor.ca)

## E) To Test your application.

Now use Opera with the IBM speech recognition plugin to access your application by directing Opera to the following URL:

[www.cs.uwindsor.ca/your\\_user\\_id/name\\_of\\_your\\_application/name\\_of\\_your\\_application.cgi](http://www.cs.uwindsor.ca/your_user_id/name_of_your_application/name_of_your_application.cgi)