UnityWebGLSpeechSynthesis

The `WebGL for Speech Synthesis` package is available in the Unity Asset Store. Online documentation is available.

See Also

- The `WebGL for Speech Detection` package is available in the Unity Asset Store. Online documentation is available.
- The `WebGL Speech` package is available in the Unity Asset Store.
  Online documentation is available.
- Try the Unity WebGL Speech Demos

Supported Platforms

- WebGL
- Mac Standalone (using Speech Proxy)
- Mac Unity Editor (using Speech Proxy)
- Windows Standalone (using Speech Proxy)
- Windows Unity Editor (using Speech Proxy)

> Note: WebGL builds use the built-in browser to use the Speech API on PC/Mac/Android/iOS. In order to use the Speech API in standalone builds and in the Unity Editor, you will need to configure and run the free Speech Proxy. ![image_12](images/image_12.png) The demo scenes have game objects to support the WebGL Plugins and the `Speech Proxy`. ![image_10](images/image_10.png) With the `Speech Proxy` running, open a browser tab that relays `Speech API` calls to and from the browser. ![image_11](images/image_11.png) Only the `WebGL Speech` package in the [Unity Asset Store](https://assetstore.unity.com/packages/tools/audio/webgl-speech-105831) has example scenes that show using `Speech Detection` and `Speech Synthesis` together.

Target

The `WebGL for Speech Synthesis` package is created for Unity version `5.3` or better. This includes support for Unity 2017.X, 2018.X, 2019.X, and 2021.X.
This package was originally created for the `WebGL` platform and supports other platforms using a `Speech Proxy`.
This package requires a browser with the built-in Web Speech API, like Chrome.
Synthesis requires an Internet connection.
Check the browser compatibility to see which browsers implemented the `Speech API`.

Tested Browsers

- Chrome
- Edge
- Firefox
- Safari

Changelog

1.0 - Initial creation of the project

1.1 - Added support for `Speech Proxy`

1.2 - Minor fixes

1.3 - Added support for speech synthesis in edit mode

1.4 - Added support for `MacOS` for `play-mode` and `edit-mode`

1.5 - Added example w ithout GUI

1.6 - Added buffering for language data

1.7 - Cleaned up sample code

1.8 - Updated sample scenes to use default 5000 port

1.9 - Added support for `2018.1` and `2019.1`.

1.10 - Added support for `2020.X`

1.11 - Added support for `2021.X`

1.12 - Added support for `iOS 16.3.1`

Demos

Demo 01 Unity Speech Synthesis

Documentation

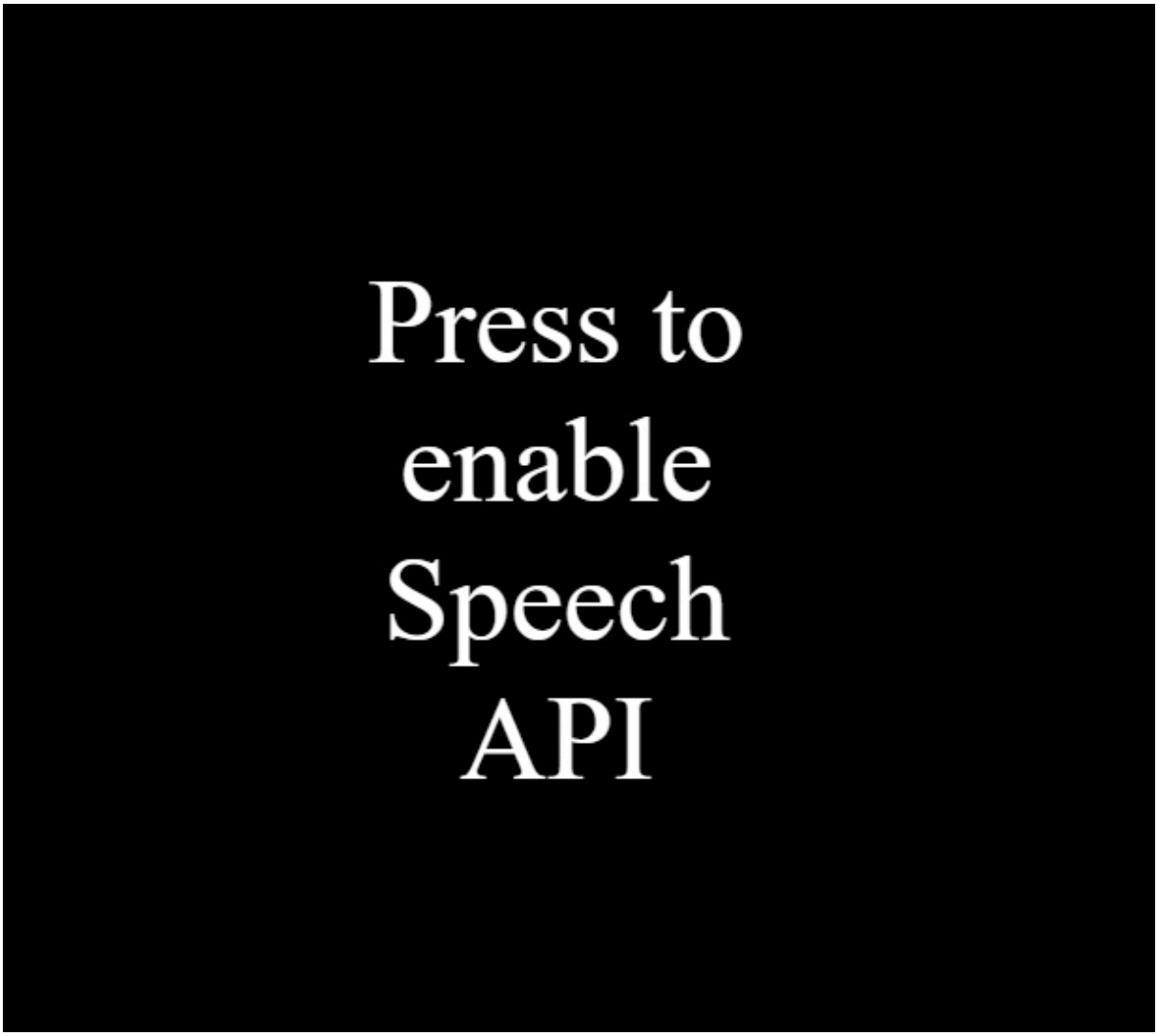
This document can be accessed in `Assets/WebGLSpeechSynthesis/Readme.pdf` or use the menuitem `GameObject->WebGLSpeechSynthesis->Online Documentation`

FAQ

- To avoid constant Microphone security prompts, host WebGL builds on secure HTTPS sites. Take a look at the online demos to see how that w orks.
- Speech can w ork on mobile as a WebGL build. Launch the Chrome brow ser app on mobile and load your WebGL page in the Chrome app.
- WebGL can take a long w hile to build. For faster development, try the Speech Proxy. This enables speech in the editor and standalone Windoow s/Mac builds w ithout the long w ait times.
- Sometimes the brow ser speech mechanism can crash. It can happen. If speech stops w orking, just close all of the brow ser w indow s and relaunch w hich should fix the issue.

> Note: In December of 2018, Chrome added a speech restriction that the speak() method can't be invoked until a web page has some user interaction.

- The WebGLSpeechSynthesis plugin now adds a full page `div` named `divActivateSpeechAPI` that initializes the Speech API when clicked to work around the new browser security. An alternative div element named `divActivateSpeechAPI` can be added to the HTML5 page if you want to customize the visual look of this user interaction.



- WebGL builds require iOS 15.5 or greater. Earlier versions will report a memory access violation.
- Unity 2021.X or later introduced a build issue when plugins use Unicode. Use the latest Unity 2021.X package from the Unity Asset Store rather than upgrading from an earlier package.

Sample Scenes

These sample scenes are located in the `Assets/WebGLSpeechSynthesis/` folder:

1 `Scenes/Example01Synthesis` - Uses WebGLSpeechSynthesisPlugin to do speech synthesis

2 `Scenes/Example02Proxy` - Uses ProxySpeechSynthesisPlugin to do speech synthesis

3 `Scenes/Example03ProxyManagement` - Management methods for launching and modifying the proxy

4 `Scenes/Example04SbaitsoClone` - Clone of a classic text to speech demo

These sample scenes are located in the `Assets/WebGLSpeechSynthesis/Editor/` folder:

5 `Example05PanelSynthesis.cs` - Unity editor panel for speech synthesis that w orks in play mode and edit mode

These sample scenes are located in the `Assets/WebGLSpeechSynthesis/` folder:

6 `Scenes/Example06NoGUI` - Speech synthesis example w ithout a GUI

7 `Scenes/Example07Buttons` - Speech synthesis w here buttons uses random voices

Modes

Synthesis modes use the same API interface other than w here the instance comes from.

WebGL Mode

The `WebGLSpeechSynthesisPlugin` uses native synthesis only for the WebGL platform.

```
ISpeechSynthesisPlugin speechSynthesisPlugin = WebGLSpeechSynthesisPlugin.GetInstance();
```

`WebGL` mode requires a `WebGLSpeechSynthesisPlugin` gameobject in the scene w hich can be created from the `GameObject->WebGLSpeechSynthesis->Create WebGLSpeechSynthesisPlugin` menu item.

Proxy Mode

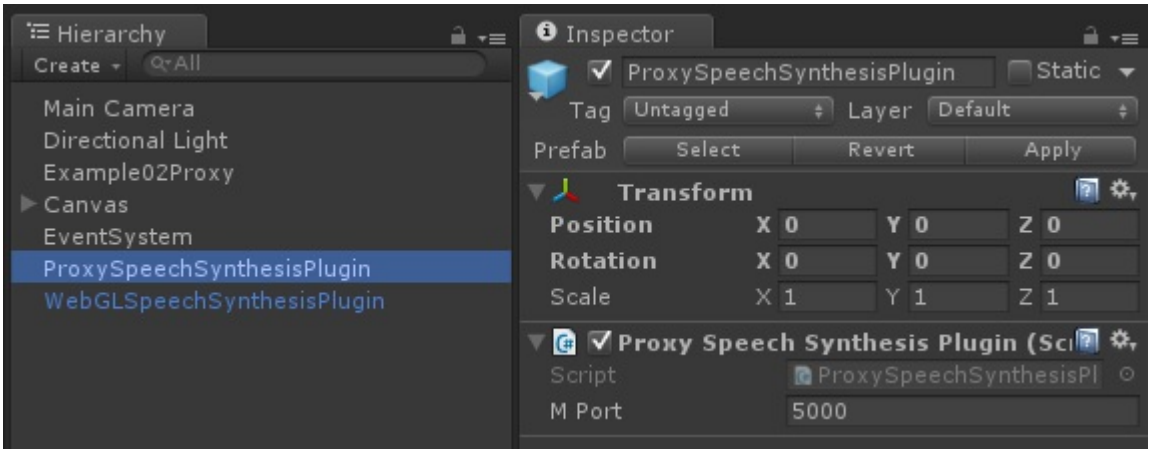
The `ProxySpeechSynthesisPlugin` uses a `Speech Proxy` to do speech synthesis for non-WebGL platforms.

```
ISpeechSynthesisPlugin speechSynthesisPlugin = ProxySpeechSynthesisPlugin.GetInstance();
```

`Proxy` mode requires a `ProxySpeechSynthesisPlugin` gameobject in the scene w hich can be created from the `GameObject->WebGLSpeechSynthesis->Create ProxySpeechSynthesisPlugin` menu item.

Also a `Speech Proxy` needs to be running for `Proxy` mode to w ork.

The `Proxy Port` is assigned by the `ProxySpeechSynthesisPlugin` gameobject w ith the inspector and needs to match the port used by the `Speech Proxy`.



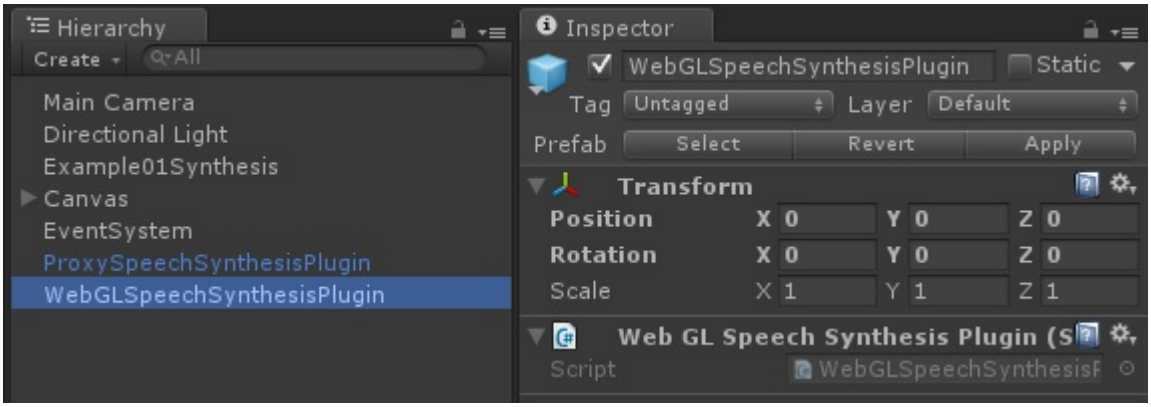
Quick Start

1 Switch to the `WebGL` platform in `Build Settings image_2

2 Create one `WebGLSpeechSynthesisPlugin` GameObject in the scene with the menu `GameObject->WebGLSpeechSynthesis->Create WebGLSpeechSynthesisPlugion` image_3

3 (Optional) You may need a voices dropdown in your UI, use the menuitem `GameObject->WebGLSpeechSynthesis->Create Voices Dropdown` image_4

4 At this point you should have a scene with the `WebGLSpeechSynthesisPlugin`, and (optionally) a voices dropdown added to the canvas.



5 Create a custom MonoBehaviour script to use the `WebGLSpeechSynthesis` API

6 Add a using statement to get access to the `WebGLSpeechSynthesis` namespace

```
using UnityWebGLSpeechSynthesis;
```

Speech Synthesis Plugin Quick Setup

7 Add a reference for `WebGLSpeechSynthesisPlugin` to the script

```
/// <summary>
/// Reference to the plugin
/// </summary>
private ISpeechSynthesisPlugin _mSpeechSynthesisPlugin = null;
```

8 In the `start event` check if the plugin is available.

```
// Use this for initialization
IEnumerator Start()
{
    // get singleton instance
    _mSpeechSynthesisPlugin = WebGLSpeechSynthesisPlugin.GetInstance();
    if (null == _mSpeechSynthesisPlugin)
    {
        Debug.LogError("WebGL Speech Synthesis Plugin is not set!");
        yield break;
    }
```

```
    // wait for proxy to become available
    while (!_mSpeechSynthesisPlugin.IsAvailable())
    {
        yield return null;
    }
}
```

Speak Quick Setup

9 Add a field to hold the utterance that w ill be spoken

```
/// <summary>
/// Reference to the utterance which holds the voice and text to speak
/// </summary>
private SpeechSynthesisUtterance _mSpeechSynthesisUtterance = null;
```

10 Create an instance of `SpeechSynthesisUtterance`

```
// Create an instance of SpeechSynthesisUtterance
_mSpeechSynthesisPlugin.CreateSpeechSynthesisUtterance((utterance) =>
{
    //Debug.LogFormat("Utterance created: {0}", utterance._mReference);
    _mSpeechSynthesisUtterance = utterance;
});
```

11 Speak the utterance

```
// Cancel if already speaking
_mSpeechSynthesisPlugin.Cancel();

// Set the text that will be spoken
_mSpeechSynthesisPlugin.SetText(_mSpeechSynthesisUtterance, _mInputField.text);

// Use the plugin to speak the utterance
_mSpeechSynthesisPlugin.Speak(_mSpeechSynthesisUtterance);
```

Voice Selection Quick Setup

12 Add a field to hold the available voices

```
/// <summary>
/// Reference to the supported voices
/// </summary>
private VoiceResult _mVoiceResult = null;
```

13 Use the plugin to get the available voices

```
_mSpeechSynthesisPlugin.GetVoices((voiceResult) =>
{
    _mVoiceResult = voiceResult;
});
```

14 Select the desired voice from the voice result

```
if (null != _mVoiceResult &&
    null != _mVoiceResult.voices)
{
    for (int i = 0; i < _mVoiceResult.voices.Length; ++i)
    {
        Voice voice = _mVoiceResult.voices[i];
        if (null == voice)
        {
            continue;
        }
        // select voice by display name
        if (!string.IsNullOrEmpty(voice.display))
        {
            options.Add(voice.display);
        }
        // select voice by name
        else if (!string.IsNullOrEmpty(voice.name))
        {
            options.Add(voice.name);
        }
    }
}
```

15 Set the voice on the utterance

```
_mSpeechSynthesisPlugin.SetVoice(_mSpeechSynthesisUtterance, voice);
```

16 Set text on the utterance and call `Speak`

```
// Set the text that will be spoken
_mSpeechSynthesisPlugin.SetText(_mSpeechSynthesisUtterance, text);

// Use the plugin to speak the utterance
_mSpeechSynthesisPlugin.Speak(_mSpeechSynthesisUtterance);
```

Proxy Management

17 Launch the `Speech Proxy`

```
// get the singleton instance
_mSpeechSynthesisPlugin = ProxySpeechSynthesisPlugin.GetInstance();

// check the reference to the plugin
if (null != _mSpeechSynthesisPlugin)
{
    // launch the proxy
    _mSpeechSynthesisPlugin.ManagementLaunchProxy();
}
```

18 Set Proxy Port

```
int port = 5000;
_mSpeechSynthesisPlugin.ManagementSetProxyPort(port);
```

19 Open Brow ser Tab

```
_mSpeechSynthesisPlugin.ManagementOpenBrowserTab();
```

20 Close Brow ser Tab

```
_mSpeechSynthesisPlugin.ManagementCloseBrowserTab();
```

21 Close Proxy

```
_mSpeechSynthesisPlugin.ManagementCloseProxy();
```

Detect Synthesis On End Events

22 After the plugin is initialized, subscribe to `SynthesisOnEnd` events.

```
// Use this for initialization
IEnumerator Start()
{
 _mSpeechSynthesisPlugin = SpeechSynthesisUtils.GetInstance();
 if (null == _mSpeechSynthesisPlugin)
 {
  Debug.LogError("Speech Synthesis Plugin is not set!");
  yield break;
 }

 // subscribe to events
 _mSpeechSynthesisPlugin.AddListenerSynthesisOnEnd(HandleSynthesisOnEnd);
}
```

23 The `SynthesisOnEnd` callback w ill fire w hen Speak() completes

```
void HandleSynthesisOnEnd(SpeechSynthesisEvent speechSynthesisEvent)
{
}
```

Set A Default Voice

```
/// <summary>
/// Speak the utterance
/// </summary>
public void Speak(string text)
{
    if (null == _mSpeechSynthesisUtterance)
    {
        Debug.LogError("Utterance is not set!");
        return;
    }

    if (string.IsNullOrEmpty(text))
    {
        return;
    }

    if (!_mVoicesSet)
    {
```

```
            return;
        }

        if (!_mUtteranceSet)
        {
            return;
        }

        // set a default voice
        if (null != _mVoiceResult &&
            null != _mVoiceResult.voices &&
            _mVoiceResult.voices.Length > 0)
        {
            for (int index = 0; index < _mVoiceResult.voices.Length; ++index)
            {
                Voice voice = _mVoiceResult.voices[index];
                if (null != voice &&
                    voice.name == "Google US English")
                {
                    _mSpeechSynthesisPlugin.SetVoice(_mSpeechSynthesisUtterance, voice);
                    break;
                }
            }
        }

        // Cancel if already speaking
        _mSpeechSynthesisPlugin.Cancel();

        // Set the text that will be spoken
        _mSpeechSynthesisPlugin.SetText(_mSpeechSynthesisUtterance, text);

        // Use the plugin to speak the utterance
        _mSpeechSynthesisPlugin.Speak(_mSpeechSynthesisUtterance);
    }
```

Scenes

Example01 - Speech Synthesis

The scene is located at `Assets/WebGLSpeechSynthesis/Scenes/Example01Synthesis.unity`

The example source is located at `Assets/WebGLSpeechSynthesis/Scripts/Example01Synthesis.cs`.

Example02 - Proxy Synthesis

The scene is located at `Assets/WebGLSpeechSynthesis/Scenes/Example02Proxy.unity`

The example source is located at `Assets/WebGLSpeechSynthesis/Scripts/Example02Proxy.cs`.

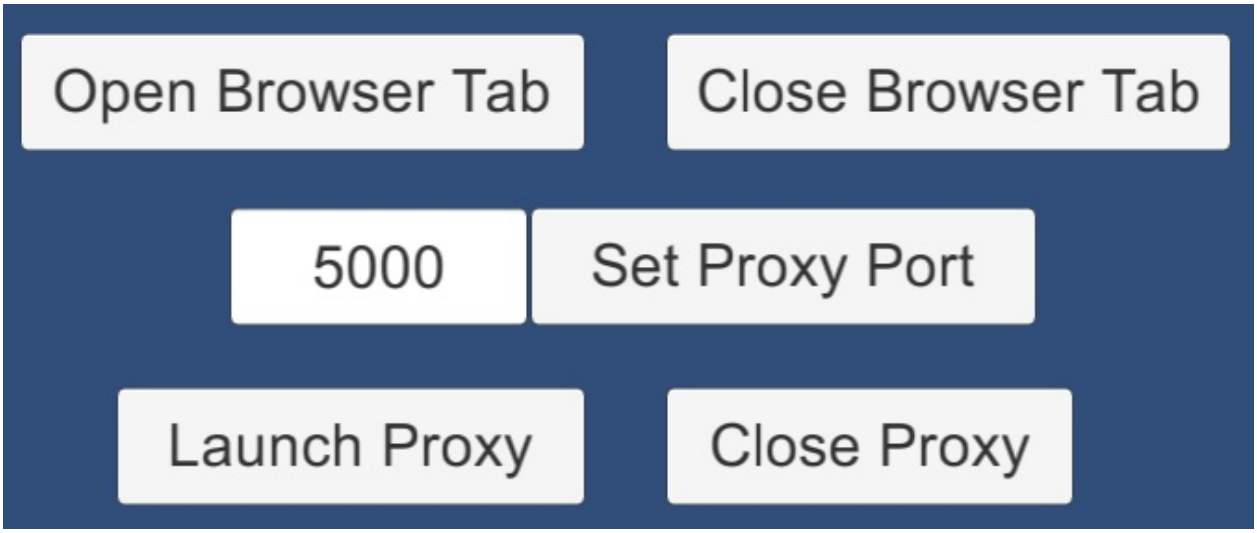
The example code is nearly identical to the non-proxy example, except for getting the synthesis instance from `ProxySpeechSynthesisPlugin`.

```
// get the singleton instance
_mSpeechSynthesisPlugin = ProxySpeechSynthesisPlugin.GetInstance();
```

Example03 - Proxy Management

The scene is located at `Assets/WebGLSpeechSynthesis/Scenes/Example03ProxyManagement.unity`.

The example source is located at `Assets/WebGLSpeechSynthesis/Scripts/Example03ProxyManagement.cs`.



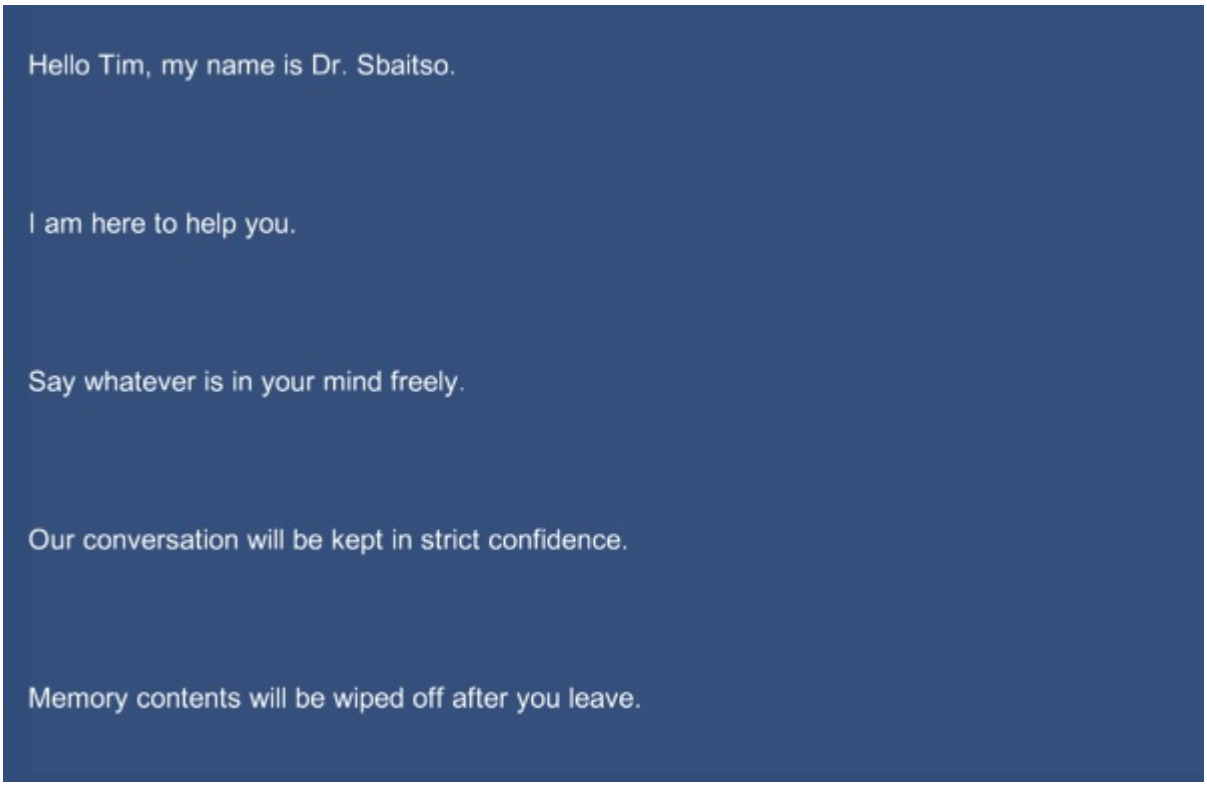
Example04 - Sbaitso Clone

The scene is located at `Assets/WebGLSpeechSynthesis/Scenes/Example04SbaitsoClone.unity`.

The example source is located at `Assets/WebGLSpeechSynthesis/Scripts/Example04SbaitsoClone.cs`.

The AI is controlled from `Assets/WebGLSpeechSynthesis/Scripts/AISbaitso.cs` which is a port from `JAVA`.

The example is a clone of the classic `Dr. Sbaitso Demo` that was bundled with `Sound Blaster Pro Audio Cards` which showcased text to speech in the `1990s`.



Example05 - Panel Synthesis

The editor panel script is located at `Assets/WebGLSpeechSynthesis/Editor/Example05PanelSynthesis.cs` and is activated via the

`Window->WebGLSpeechSynthesis->Open Example05PanelSynthesis` menu item.

The example panel shows speech synthesis working in edit and play modes.

The panel example uses the `EditorProxySpeechSynthesisPlugin` to proxy the speech api in `edit` mode.

Example06 - No GUI

The scene is located at `Assets/WebGLSpeechSynthesis/Scenes/Example06NoGUI.unity`

The example source is located at `Assets/WebGLSpeechSynthesis/Scripts/Example06NoGUI.cs`.

Example07 - Buttons

The scene is located at `Assets/WebGLSpeechSynthesis/Scenes/Example07Buttons.unity`

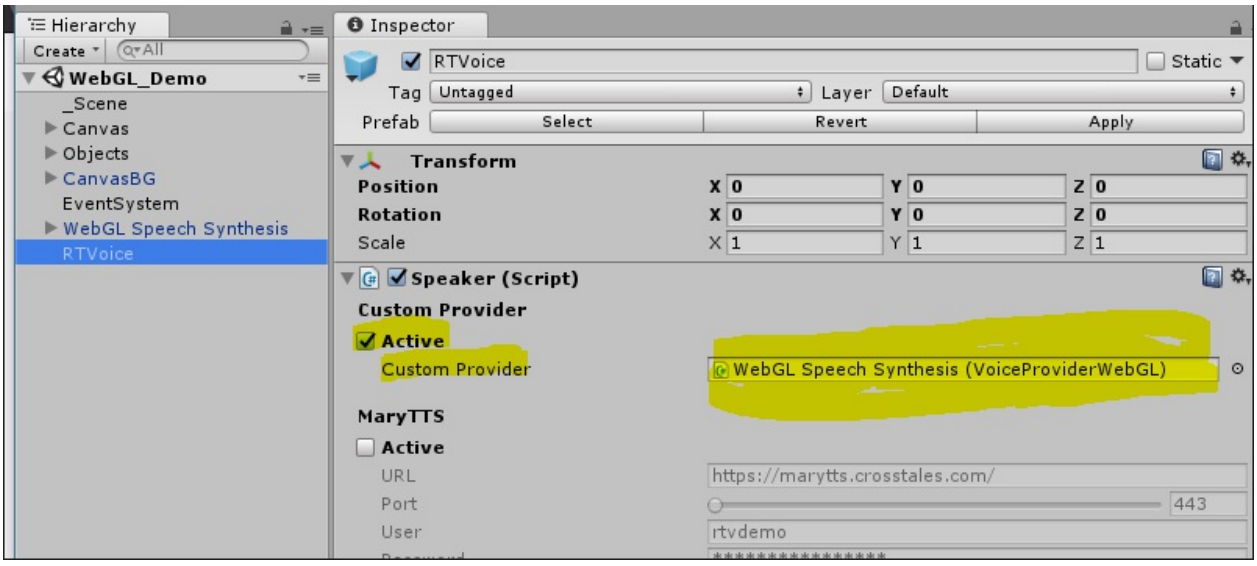
The example source is located at `Assets/WebGLSpeechSynthesis/Scripts/Example07Buttons.cs`.

FAQ

Q: How do I integrate with RT_Voice?

Within the RT-Voice package, there is a demo scene called "WebGL_Demo". RT-Voice provides a 3rd party package for your asset and a prefab "WebGL Speech Synthesis", which has to be added to the scene and the "RTVoice"-prefab.

Add the "WebGL Speech Synthesis"-prefab as "Custom Provider":



Support

Send questions and/or feedback to the support@theylovegames.com email.

Support is also available in Discord, you can reach me at `Tim Graupmann#0611`.