UnityWebGLSpeechDetection

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

See Also

- The `WebGL for Speech Synthesis` 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_17](images/image_17.png) The demo scenes have game objects to support the WebGL Plugins and the `Speech Proxy`. ![image_15](images/image_15.png) With the `Speech Proxy` running, open a browser tab that relays `Speech API` calls to and from the browser. ![image_16](images/image_16.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 Detection` 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.
Detection requires an Internet connection.
Check the browser compatibility to see which browsers implemented the `Speech API`.

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 detection in edit mode

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

1.5 - Added dictation and command examples without 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 Dictation

Demo 02 Unity Speech Commands

Documentation

This document can be accessed in `Assets/WebGLSpeechDetection/Readme.pdf` or use the menuitem `GameObject->WebGLSpeechDetection->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 works.
- Speech can work on mobile as a WebGL build. Launch the Chrome browser app on mobile and load your WebGL page in the Chrome app.
- WebGL can take a long while to build. For faster development, try the Speech Proxy. This enables speech in the editor and standalone Windoows/Mac builds without the long wait times.
- Sometimes the browser speech mechanism can crash. It can happen. If speech stops working, just close all of the browser windows and relaunch which 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.

Sample Scenes

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

1 `Example01_Dictation` - Uses WebGLSpeechDetectionPlugin to do speech dictation

2 `Example02_SpeechCommands` - Uses WebGLSpeechDetectionPlugin to do speech commands

3 `Example03_ProxyCommands` - Uses ProxySpeechDetectionPlugin to do speech commands

4 `Example04_ProxyDictation` - Uses ProxySpeechDetectionPlugin to do speech dictation

5 `Example05_ProxyManagement` - Management methods for launching and modifying the proxy

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

6 `Example06PanelDictation.cs` - Unity editor panel for speech dictation that w orks in play mode and edit mode

7 `Example07PanelCommands.cs` - Unity editor panel for speech commands that w orks in play mode and edit mode

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

8 `Example08_NoGUIDictation` - Do dictation w ithout a GUI

9 `Example09_NoGUISpeechCommands` - Do commands w ithout a GUI

Modes

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

WebGL Mode

The `WebGLSpeechDetectionPlugin` uses native detection only for the WebGL platform.

```
ISpeechDetectionPlugin speechDetectionPlugin = WebGLSpeechDetectionPlugin.GetInstance();
```

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

Proxy Mode

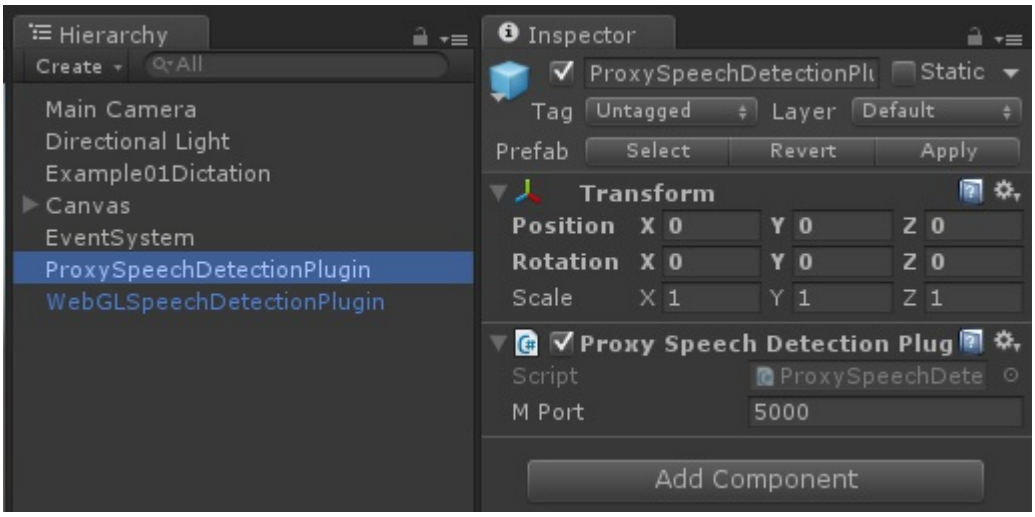
The `ProxySpeechDetectionPlugin` uses a `Speech Proxy` to do speech detection for non-WebGL platforms.

```
ISpeechDetectionPlugin speechDetectionPlugin = ProxySpeechDetectionPlugin.GetInstance();
```

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

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

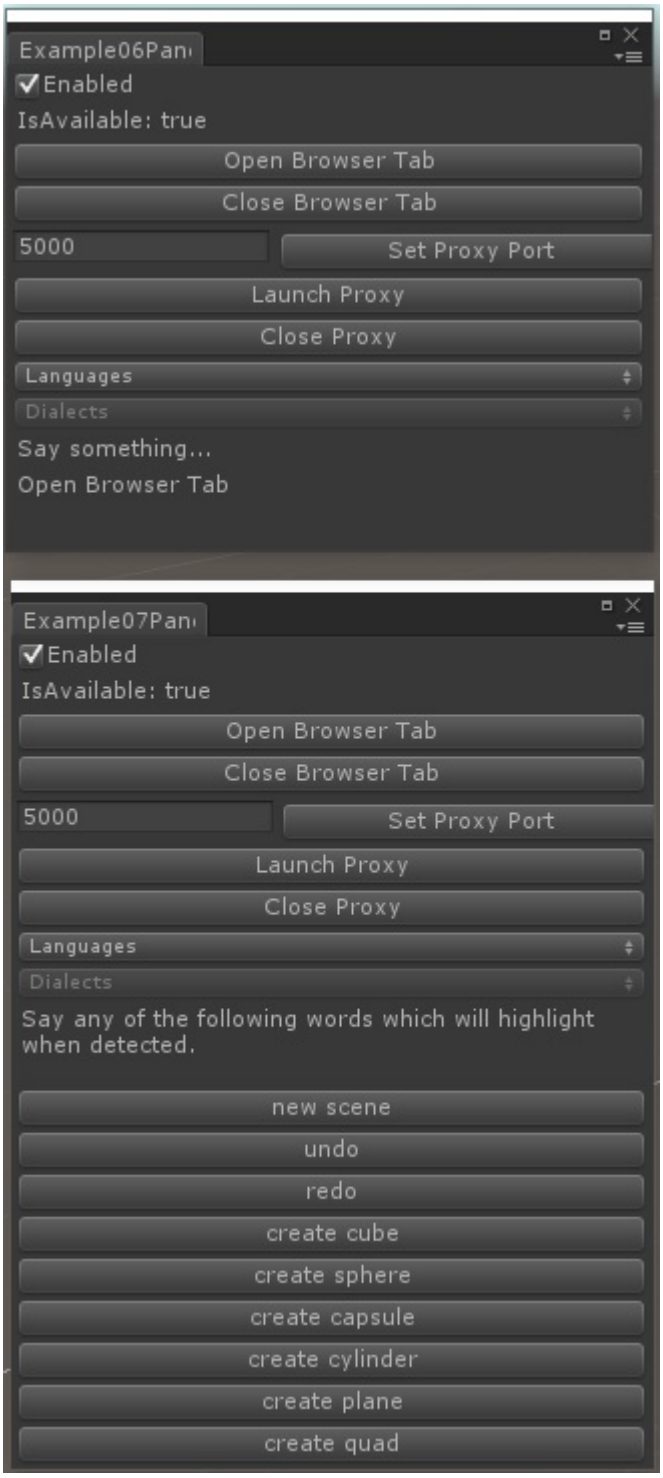
The `Proxy Port` is assigned by the `ProxySpeechDetectionPlugin` gameobject w ith the inspector and needs to match the port used by the `Speech Proxy`.



Edit Mode

The `EditorProxySpeechDetectionPlugin` uses a `Speech Proxy` to do speech detection for editor panels in the Unity editor.

```
ISpeechDetectionPlugin speechDetectionPlugin = EditorProxySpeechDetectionPlugin.GetInstance();
```



Quick Start

1 Switch to the `WebGL` platform in `Build Settings image_1

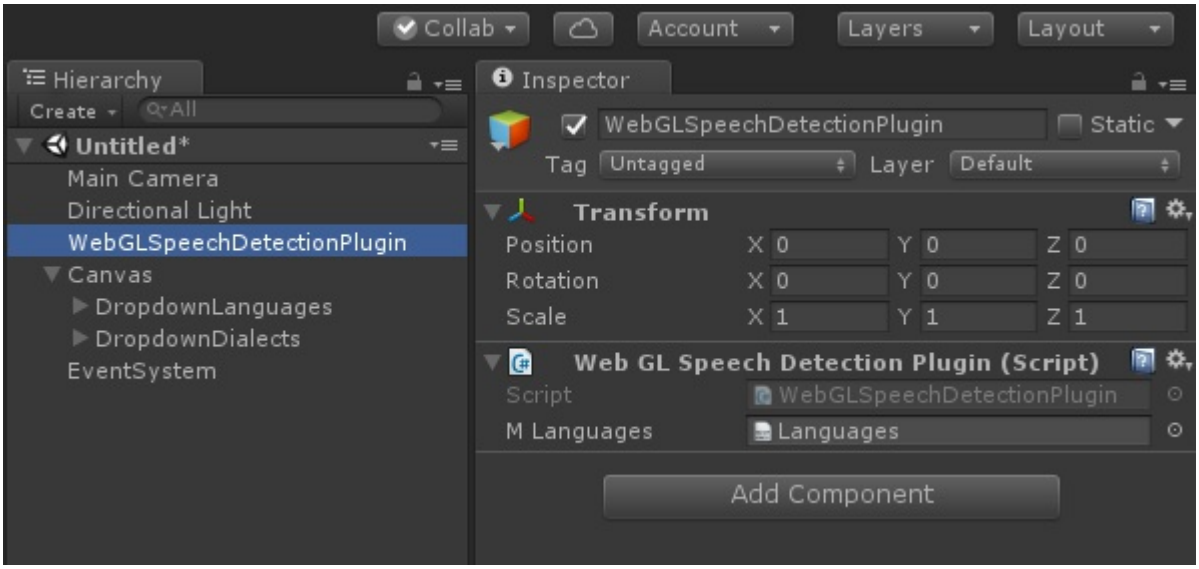
2 Create one `WebGLSpeechDetectionPlugin` GameObject in the scene with the menu `GameObject->WebGLSpeechDetection->Create WebGLSpeechDetectionPlugin` image_2

3 (Optional) You may need a languages dropdown in your UI, use the menuitem `GameObject->WebGLSpeechDetection->Create Languages Dropdown` image_3

4 (Optional) You may need a dialects dropdown in your UI, use the menuitem `GameObject->WebGLSpeechDetection->Create Dialects`

`Dropdown` image_4

5 At this point you should have a scene w ith the `WebGLSpeechDetectionPlugin`, and (optionally) a couple dropdow n controls added to the canvas.



6 Create a custom MonoBehaviour script to use the `WebGLSpeechDetection` API

7 Add a using statement to get access to the `WebGLSpeechDetection` namespace

```
using UnityWebGLSpeechDetection;
```

Speech Detection Quick Setup

8 Add a reference for `WebGLSpeechDetectionPlugin` to the script

```
        /// <summary>
        /// Reference to the plugin
        /// </summary>
        private ISpeechDetectionPlugin _mSpeechDetectionPlugin = null;
```

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

```
        // Use this for initialization
        IEnumerator Start()
        {
            // get the singleton instance
            _mSpeechDetectionPlugin = WebGLSpeechDetectionPlugin.GetInstance();

            // check the reference to the plugin
            if (null == _mSpeechDetectionPlugin)
            {
                Debug.LogError("WebGL Speech Detection Plugin is not set!");
                yield break;
            }

            // wait for plugin to become available
            while (!_mSpeechDetectionPlugin.IsAvailable())
            {
                yield return null;
```

```
        }
    }
```

10 In the `start event`, if the plugin is available, subscribe to detection events.

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

        // subscribe to events
        _mSpeechDetectionPlugin.AddListenerOnDetectionResult(HandleDetectionResult);
```

11 Add a handler method to receive speech detection events

```
    /// <summary>
    /// Handler for speech detection events
    /// </summary>
    /// <param name="detectionResult"></param>
    /// <returns>Return true if the result was handled</returns>
    bool HandleDetectionResult(DetectionResult detectionResult)
    {
        return false; //not handled
    }
```

Language Selection Quick Setup

12 Add a field to hold the available languages and dialects

```
    /// <summary>
    /// Reference to the supported languages and dialects
    /// </summary>
    private LanguageResult _mLanguageResult = null;
```

13 Use the plugin to get the available languages and dialects

```
        // Get languages from plugin,
        _mSpeechDetectionPlugin.GetLanguages((languageResult) =>
        {
            _mLanguageResult = languageResult;
        }
```

14 Populate the language dropdown using the language result

```
            // prepare the language drop down items
            SpeechDetectionUtils.PopulateLanguagesDropdown(_mDropDownLanguages, _mLanguageResult);
```

15 Handle language change events from the dropdown

```
            // subscribe to language change events
            if (_mDropDownLanguages)
            {
```

```
        _mDropDownLanguages.onValueChanged.AddListener(delegate {
            SpeechDetectionUtils.HandleLanguageChanged(_mDropDownLanguages,
                _mDropDownDialects,
                _mLanguageResult,
                _mSpeechDetectionPlugin);
        });
    }
```

16 Handle dialect change events from the dropdow n

```
    // subscribe to dialect change events
    if (_mDropDownDialects)
    {
        _mDropDownDialects.onValueChanged.AddListener(delegate {
            SpeechDetectionUtils.HandleDialectChanged(_mDropDownDialects,
                _mLanguageResult,
                _mSpeechDetectionPlugin);
        });
    }
```

17 Before a language is selected, disable the dialect dropdow n

```
    // Disabled until a language is selected
    SpeechDetectionUtils.DisableDialects(_mDropDownDialects);
```

18 Use player prefs to default to the last selected language and dialect

```
    // set the default language
    SpeechDetectionUtils.SetDefaultLanguage(_mDropDownLanguages);

    // set the default dialect
    SpeechDetectionUtils.SetDefaultDialect(_mDropDownDialects);
```

Proxy Management

19 Launch the `Speech Proxy`

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

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

20 Set Proxy Port

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

21 Open Brow ser Tab

```
_mSpeechDetectionPlugin.ManagementOpenBrowserTab();
```

22 Close Brow ser Tab

```
_mSpeechDetectionPlugin.ManagementCloseBrowserTab();
```

23 Close Proxy

```
_mSpeechDetectionPlugin.ManagementCloseProxy();
```

Fonts

UI text controls need to reference fonts that contain the entire character range for the selected language and dialect in order to display correctly.

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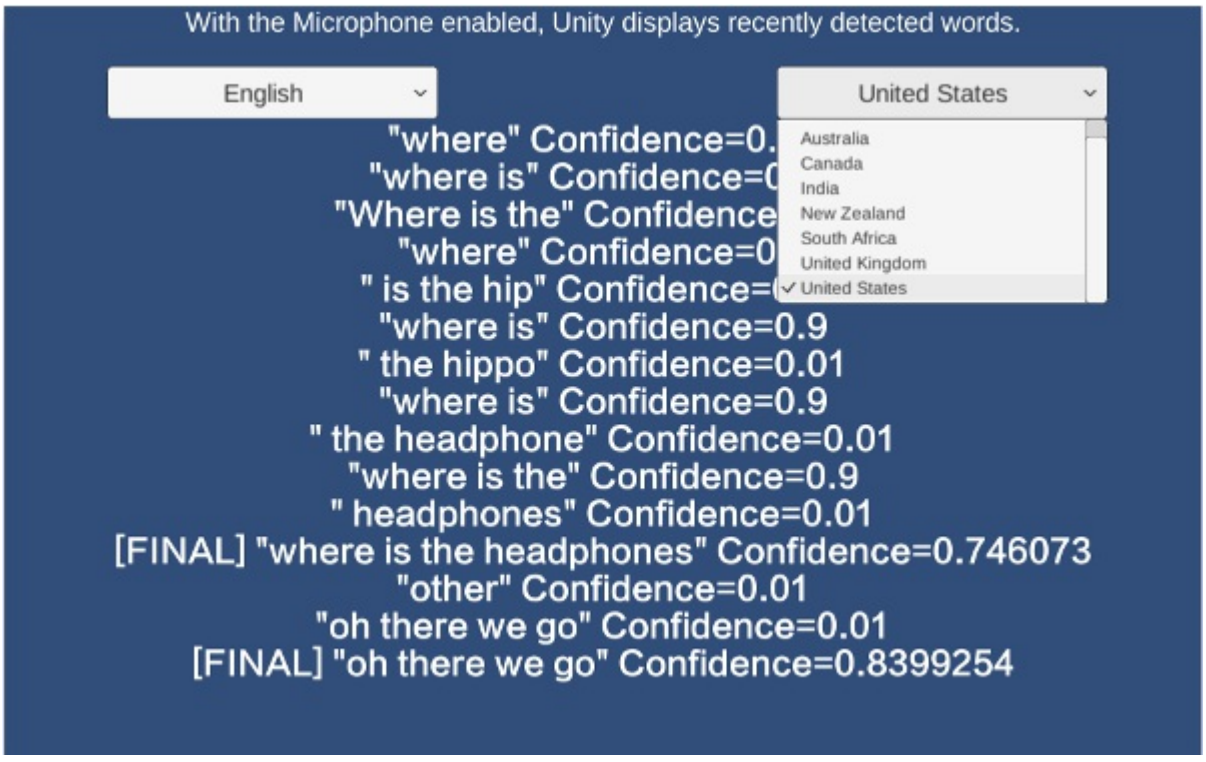
Scenes

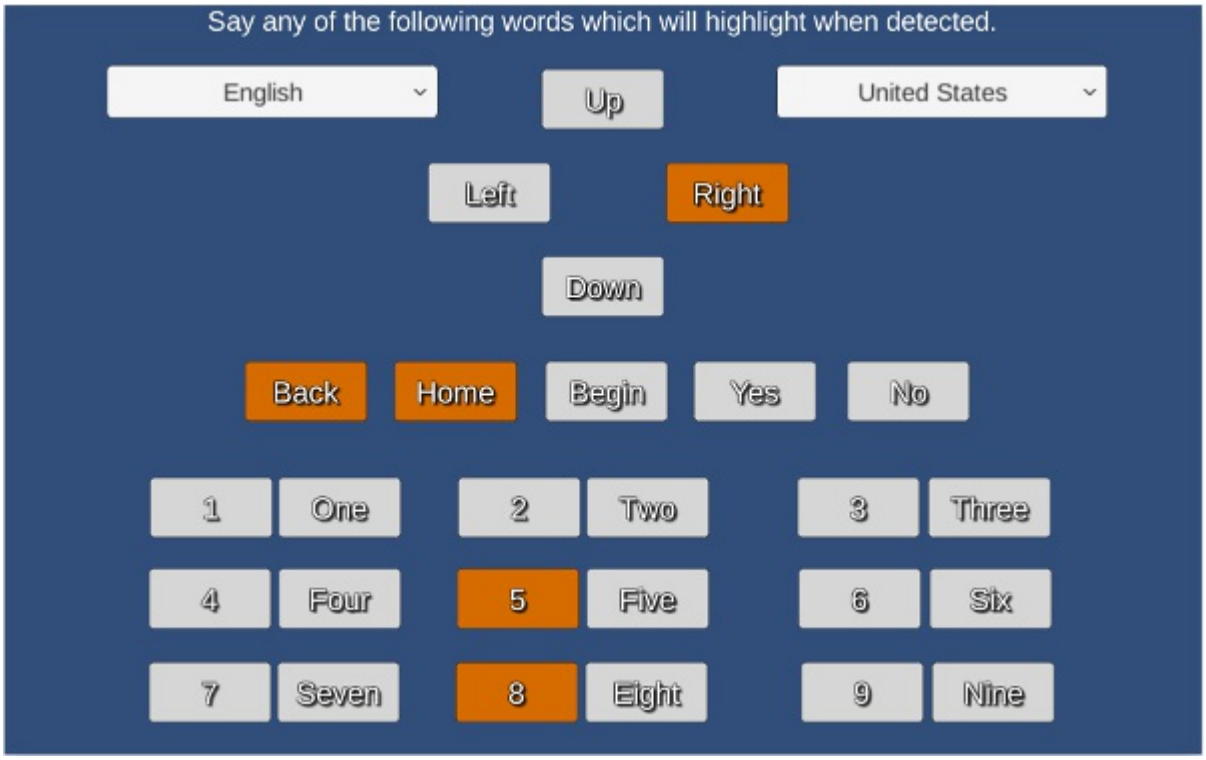
Example01 - Dictation

The scene is located at `Assets/WebGLSpeechDetection/Scenes/Example01_Dictation.unity`



Example02 - Speech Commands

The scene is located at `Assets/WebGLSpeechDetection/Scenes/Example02_SpeechCommands.unity`



Example03 - Proxy Commands

The scene is located at `Assets/WebGLSpeechDetection/Scenes/Example03_ProxyCommands`

The example code is nearly identical to the SpeechCommands example, except for getting the detection instance from `ProxySpeechDetectionPlugin`.

```
            // get the singleton instance
            _mSpeechDetectionPlugin = ProxySpeechDetectionPlugin.GetInstance();
```

Example04 - Proxy Dictation

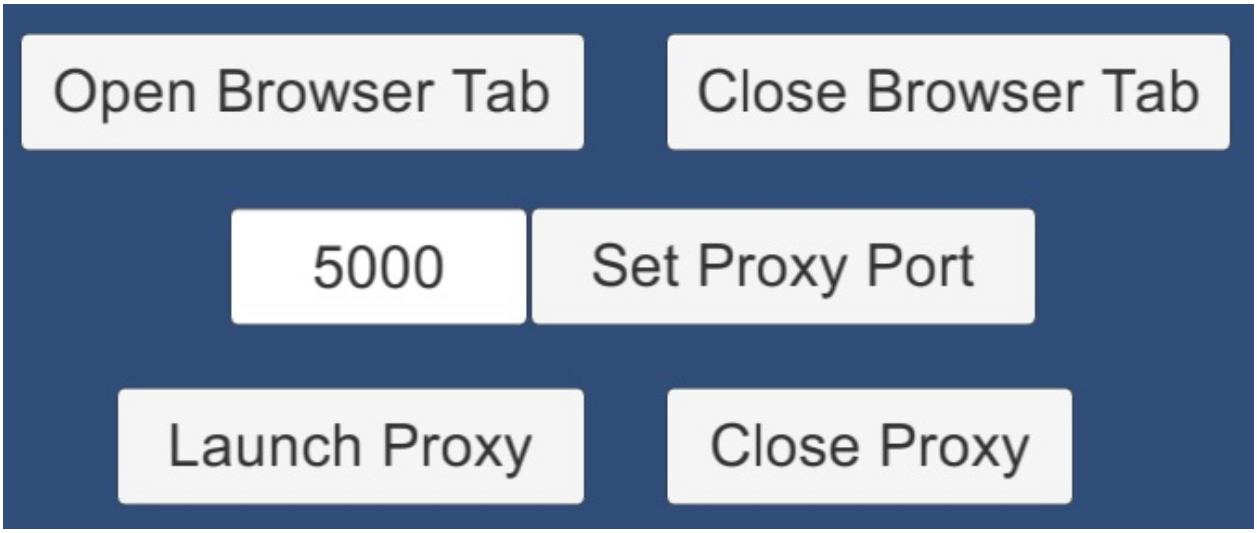
The scene is located at `Assets/WebGLSpeechDetection/Scenes/Example04_ProxyDictation`

The example code is nearly identical to the SpeechDictation example, except for getting the detection instance from `ProxySpeechDetectionPlugin`.

```
            // get the singleton instance
            _mSpeechDetectionPlugin = ProxySpeechDetectionPlugin.GetInstance();
```

Example05 - Proxy Management

The scene is located at `Assets/WebGLSpeechDetection/Scenes/Example05_ProxyManagement.unity`



Example06 - Panel Dictation

The editor panel script is located at `Assets/WebGLSpeechDetection/Editor/Example06PanelDictation.cs` and is activated via the `Window->WebGLSpeechDetection->Open Example06PanelDictation` menu item.

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

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

Example07 - Panel Commands

The editor panel script is located at `Assets/WebGLSpeechDetection/Editor/Example07PanelCommands.cs` and is activated via the `Window->WebGLSpeechDetection->Open Example07PanelCommands` menu item.

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

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

Several menu items are automated with speech in the `Assets/WebGLSpeechDetection/Editor/Menu.cs` script.

Menu items are automated with speech using a custom attribute `SpeechDetectionAttribute`.

The custom attribute takes a `spokenPhrase` which when spoken will invoke the `public static` method.

The `spokenPhrase` can be a single or multiple words separated with a space and need to be spoken in the specified order.

The `spokenPhrase` should also be lower cased.

```
        [SpeechDetectionAttribute(spokenPhrase: "duplicate")]
        // needs to be public static
        public static void EditDuplicate()
        {
            ... implementation ...
        }
```

The example panel will detect any C# classes in the project that have `public static` methods with the `SpeechDetectionAttribute` custom attribute.

Example08 - No GUI Dictation

The scene is located at `Assets/WebGLSpeechDetection/Scenes/Example08_NoGUIDictation.unity`

The example source is located at `Assets/WebGLSpeechDictation/Scripts/Example08NoGUIDictation.cs`.

Example09 - No GUI Speech Commands

The scene is located at `Assets/WebGLSpeechDetection/Scenes/Example09_NoGUISpeechCommands.unity`

The example source is located at `Assets/WebGLSpeechDictation/Scripts/Example09NoGUISpeechCommands.cs`.

FAQ

- Q: How do I set the default detection language?
- A: You can set the default language by invoking from the `Start` coroutine.

Here is a coroutine that sets the default language.

```
/// <summary>
/// Set the detection language
/// </summary>
/// <param name="name"></param>
/// <returns></returns>
public IEnumerator SetLanguage(string languageDisplay)
{
    // check the reference to the plugin
    if (null == _mSpeechDetectionPlugin)
    {
        Debug.LogError("WebGL Speech Detection Plugin is not set!");
        yield break;
    }

    // wait for plugin to become available
    while (!_mSpeechDetectionPlugin.IsAvailable())
    {
        yield return null;
    }

    // Get languages from the plugin
    _mSpeechDetectionPlugin.GetLanguages((languageResult) =>
    {
        // default detection language to JP
        foreach (Language language in languageResult.languages)
        {
            if (language.display == languageDisplay)
            {
                foreach (Dialect dialect in language.dialects)
                {
                    _mSpeechDetectionPlugin.SetLanguage(dialect.name);
                    Debug.LogFormat("Set default language={0} display={1} dialect={2} display={3}",
                        language.name, language.display,
                        dialect.name, dialect.display);
                    return;
                }
            }
        }
    });
}
```

Here is a coroutine that sets the default language and dialect.

```
public IEnumerator SetDialect(string languageDisplay, string dialectDisplay)
{
    // check the reference to the plugin
    if (null == _mSpeechDetectionPlugin)
    {
        Debug.LogError("WebGL Speech Detection Plugin is not set!");
        yield break;
    }

    // wait for plugin to become available
    while (!_mSpeechDetectionPlugin.IsAvailable())
    {
        yield return null;
    }

    // Get languages from the plugin
    _mSpeechDetectionPlugin.GetLanguages((languageResult) =>
    {
        // default detection language to JP
        foreach (Language language in languageResult.languages)
        {
            if (language.display == languageDisplay)
            {
                foreach (Dialect dialect in language.dialects)
                {
                    if (dialect.display == dialectDisplay)
                    {
                        _mSpeechDetectionPlugin.SetLanguage(dialect.name);
                        Debug.LogFormat("Set default language={0} display={1} dialect={2} display={3}",
                            language.name, language.display,
                            dialect.name, dialect.display);
                        return;
                    }
                }
            }
        }
    });
}
```

Your start coroutine can set the default language.

```
// Use this for initialization
IEnumerator Start()
{
    // get the singleton instance
    _mSpeechDetectionPlugin = SpeechDetectionUtils.GetInstance();

    // check the reference to the plugin
    if (null == _mSpeechDetectionPlugin)
    {
        Debug.LogError("WebGL Speech Detection Plugin is not set!");
        yield break;
    }

    // wait for plugin to become available
    while (!_mSpeechDetectionPlugin.IsAvailable())
    {
        yield return null;
    }

    // subscribe to events
    _mSpeechDetectionPlugin.AddListenerOnDetectionResult(HandleDetectionResult);

    // Default language
    yield return SetLanguage("Japanese");
}
```

You can find the available proxy languages and dialects here.

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`.