

.NET MAUI - reporting events to the GUI

In this page, we will send a notification of an event back to the .NET GUI.

The resulting project is as follows: [ExcersisTapCallback.zip](#)

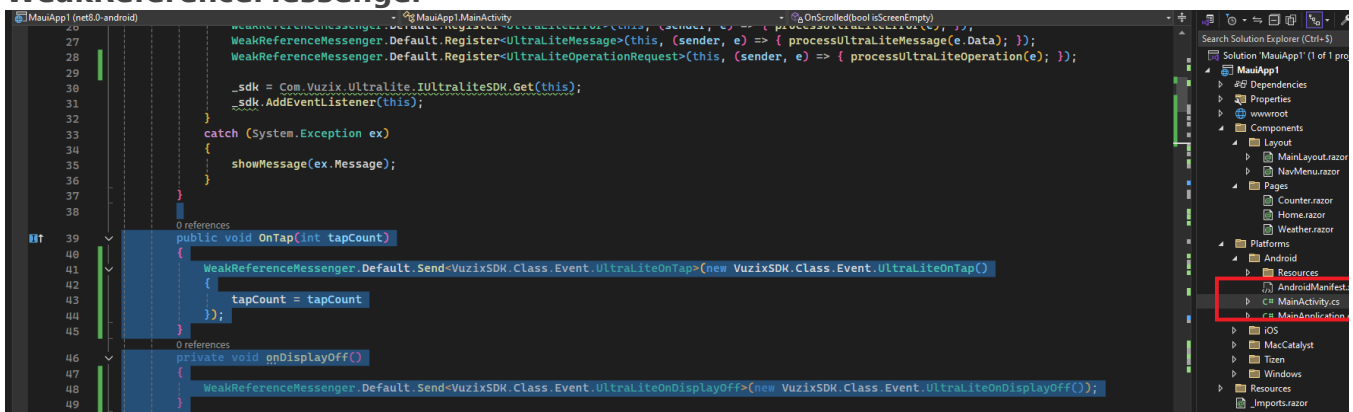
This way, we're completely disconnected with the Android stack and can focus on development in MAUI or .NET and only consider a few functions to interact with the glasses.

Note on code design: in a real world application, you would register a handler in a service in .NET - as their "Dependency Injection" is very good. But this code will be sufficient to demonstrate the interface with the glasses.

So let's go!

We'll start off again with the last project [.NET MAUI - Handling taps](#)

1. Update the Nuget package, we require at least [VuzixSDK 1.0.1](#)
2. Change the event functions in the **MainActivity** to send the events via the **WeakReferenceMessenger**



```
public void OnTap(int tapCount)
{
    WeakReferenceMessenger.Default.Send<VuzixSDK.Class.Event.UltraLiteOnTap>(new
    VuzixSDK.Class.Event.UltraLiteOnTap())
```

```

    {
        tapCount = tapCount
    });
}
private void onDisplayOff()
{
    WeakReferenceMessenger.Default.Send<VuzixSDK.Class.Event.UltraLiteOnDisplayOff>(new
VuzixSDK.Class.Event.UltraLiteOnDisplayOff());
}
private void onDisplayOn()
{
    WeakReferenceMessenger.Default.Send<VuzixSDK.Class.Event.UltraLiteOnDisplayOn>(new
VuzixSDK.Class.Event.UltraLiteOnDisplayOn());
}
private void onDisplayTimeout()
{
    WeakReferenceMessenger.Default.Send<VuzixSDK.Class.Event.UltraLiteOnDisplayTimeout>(new
VuzixSDK.Class.Event.UltraLiteOnDisplayTimeout());
}
private void OnPowerButtonPress(bool turningOn)
{
    WeakReferenceMessenger.Default.Send<VuzixSDK.Class.Event.UltraLiteOnPowerButtonPress>(new
VuzixSDK.Class.Event.UltraLiteOnPowerButtonPress()
    {
        turningOn = turningOn
    });
}
private void OnScrolled(bool isScreenEmpty)
{
    WeakReferenceMessenger.Default.Send<VuzixSDK.Class.Event.UltraLiteOnScrolled>(new
VuzixSDK.Class.Event.UltraLiteOnScrolled()
    {
        isScreenEmpty = isScreenEmpty
    });
}

```

Your MainActivity.cs will look as follows:

```

using Android.App;
using Android.Content.PM;

```

```

using Android.OS;
using Android.Widget;
using CommunityToolkit.Mvvm.Messaging;
using VuzixSDK.Class;
using Com.Vuzix.Ultralite;
using Layout = Com.Vuzix.Ultralite.Layout;
using TextAlignment = Com.Vuzix.Ultralite.TextAlignment;
using VuzixSDK.Enum;
using Android.Graphics;
using System.Diagnostics.Tracing;
using static System.Net.Mime.MediaTypeNames;

namespace MauiApp1
{
    [Activity(Theme = "@style/Maui.SplashTheme", MainLauncher = true, ConfigurationChanges =
ConfigChanges.ScreenSize | ConfigChanges.Orientation | ConfigChanges.UiMode | ConfigChanges.ScreenLayout |
ConfigChanges.SmallestScreenSize | ConfigChanges.Density)]
    public class MainActivity : MauiAppCompatActivity, Com.Vuzix.Ultralite.IEventListener
    {
        IUltraliteSDK _sdk;

        protected override void OnCreate(Bundle savedInstanceState)
        {
            base.OnCreate(savedInstanceState);

            try
            {
                WeakReferenceMessenger.Default.Register<UltraLiteError>(this, (sender, e) => {
processUltraLiteError(e); });

                WeakReferenceMessenger.Default.Register<UltraLiteMessage>(this, (sender, e) => {
processUltraLiteMessage(e.Data); });

                WeakReferenceMessenger.Default.Register<UltraLiteOperationRequest>(this, (sender, e) => {
processUltraLiteOperation(e); });

                _sdk = Com.Vuzix.Ultralite.IUltraliteSDK.Get(this);
                _sdk.AddEventListener(this);
            }
            catch (System.Exception ex)
            {
                showMessage(ex.Message);
            }
        }
    }
}

```

```

    public void OnTap(int tapCount)
    {
        WeakReferenceMessenger.Default.Send<VuzixSDK.Class.Event.UltraLiteOnTap>(new
VuzixSDK.Class.Event.UltraLiteOnTap()
        {
            tapCount = tapCount
        });
    }
    private void onDisplayOff()
    {
        WeakReferenceMessenger.Default.Send<VuzixSDK.Class.Event.UltraLiteOnDisplayOff>(new
VuzixSDK.Class.Event.UltraLiteOnDisplayOff());
    }
    private void onDisplayOn()
    {
        WeakReferenceMessenger.Default.Send<VuzixSDK.Class.Event.UltraLiteOnDisplayOn>(new
VuzixSDK.Class.Event.UltraLiteOnDisplayOn());
    }
    private void onDisplayTimeout()
    {
        WeakReferenceMessenger.Default.Send<VuzixSDK.Class.Event.UltraLiteOnDisplayTimeout>(new
VuzixSDK.Class.Event.UltraLiteOnDisplayTimeout());
    }
    private void OnPowerButtonPress(bool turningOn)
    {
        WeakReferenceMessenger.Default.Send<VuzixSDK.Class.Event.UltraLiteOnPowerButtonPress>(new
VuzixSDK.Class.Event.UltraLiteOnPowerButtonPress()
        {
            turningOn = turningOn
        });
    }
    private void OnScrolled(bool isScreenEmpty)
    {
        WeakReferenceMessenger.Default.Send<VuzixSDK.Class.Event.UltraLiteOnScrolled>(new
VuzixSDK.Class.Event.UltraLiteOnScrolled()
        {
            isScreenEmpty = isScreenEmpty
        });
    }

```

```

public void clearScreen()
{
    _sdk.Canvas.RemoveText(_lastTextId);
    _sdk.Canvas.RemoveAnimation(_lastAnimationId);
    _sdk.Canvas.RemoveImage(_lastImageId);
}

public void showMessage(string message)
{
    MainThread.BeginInvokeOnMainThread(() =>
    {
        var toast = Toast.MakeText(this, message, ToastLength.Short);
        toast.Show();
    });
}

protected void processUltraLiteError(UltraLiteError error)
{
    if (_sdk.IsConnected)
    {
        if (!_sdk.IsControlledByMe)
        {
            _sdk.RequestControl();
        }
        if (_sdk.IsControlledByMe)
        {
            string _title = $"[Error]{{(error.Source != null ? " " + error.Source : "")}}";
            string _error = (error.Exception != null ? $"Exception : {{error.Exception.Message}}" : "Error
occured");
            _sdk.SendNotification(_title, _error);
        }
    }

    int _lastTextId = -1;
    int _lastImageId = -1;
    int _lastAnimationId = -1;

protected void processUltraLiteMessage(String message)
{
    if (_sdk.IsConnected)
    {
        if (!_sdk.IsControlledByMe)

```

```

    {
        _sdk.RequestControl();
    }
    if (_sdk.IsControlledByMe)
    {
        _sdk.SetLayout(Layout.Canvas, 0, true);
        bool _messageSucceeded = false;
        if (_lastTextId >= 0)
        {
            _messageSucceeded = _sdk.Canvas.UpdateText(_lastTextId, message);
        }
        else
        {
            _lastTextId = _sdk.Canvas.CreateText(message, Anchor.Center);
            _messageSucceeded = (_lastTextId != -1);
        }
        if (!_messageSucceeded)
        {
            showMessage("Text failed");
        }
        _sdk.Canvas.Commit();
        SystemClock.Sleep(1000);
    }
}

protected void processUltraLiteOperation(UltraLiteOperationRequest Request)
{
    if (_sdk.IsConnected)
    {
        if (!_sdk.IsControlledByMe)
        {
            _sdk.RequestControl();
        }
        if (_sdk.IsControlledByMe)
        {
            _sdk.SetLayout(Layout.Canvas, 0, true);
            if (Request.Operation == eUltraLiteOperation.ShowImage && Request.ImageBitMap != null)
            {
                LVGLImage image = loadLVGLImage(Request.ImageBitMap);
                bool _imageSucceeded = false;
            }
        }
    }
}

```

```

        if (_lastImageId >= 0)
        {
            _imageSucceeded = _sdk.Canvas.UpdateImage(_lastImageId, image);
        }
        else
        {
            _lastAnimationId = _sdk.Canvas.CreateImage(image, Anchor.Center);
            _imageSucceeded = (_lastImageId != -1);
        }

        if(!_imageSucceeded) showMessage("Image failed");
        _sdk.Canvas.Commit();
    }

    if (Request.Operation == eUltraLiteOperation.ShowAnimation && Request.AnimationBitMap != null)
    {
        LVGLImage[] image = loadLVGLImage(Request.AnimationBitMap);
        int _animationDelay = 500;
        if(_lastAnimationId >= 0)
        {
            _sdk.Canvas.RemoveAnimation(_lastAnimationId);
        }
        _lastAnimationId = _sdk.Canvas.CreateAnimation(image, Anchor.Center, _animationDelay);

        if (_lastAnimationId == -1)
        {
            showMessage("Animation failed");
        }
        _sdk.Canvas.Commit();
    }
}

else
{
    showMessage("SDK is not connected");
}

private static Bitmap loadBitmap(byte[] bitmapbytes)
{
    BitmapFactory.Options options = new BitmapFactory.Options();

```

```
// https://proandroiddev.com/image-decoding-bitmaps-android-c039790ee07e
```

```
options.InSampleSize = 2;
```

```
//options.InTargetDensity = 640 * 2;
```

```
//options.InTargetDensity = 480 * 8;
```

```
//options.InScaled = true;
```

```
options.InPreferredConfig = Bitmap.Config.Argb8888;
```

```
/* options.InMutable = true;
```

```
options.InSampleSize = 8;
```

```
options.OutWidth = 600;
```

```
options.OutHeight = 400;
```

```
options.InScaled = scaled;*/
```

```
Bitmap bmp = BitmapFactory.DecodeByteArray(bitmapbytes, 0, bitmapbytes.Length, options);
```

```
return bmp;// resize(bmp, 640, 480);
```

```
}
```

```
private static LVGLImage[] loadLVGLImage(List<byte[]> images)
```

```
{
```

```
List<LVGLImage> _images = new List<LVGLImage>();
```

```
foreach (var image in images)
```

```
{
```

```
_images.Add(LVGLImage.FromBitmap(loadBitmap(image), LVGLImage.CfIndexed1Bit));
```

```
}
```

```
return _images.ToArray();
```

```
}
```

```
private static LVGLImage loadLVGLImage(byte[] image)
```

```
{
```

```
//ColorObject[] _colors = { LVGLImage.IColorMapper.White, LVGLImage.IColorMapper.Mid };
```

```
//LVGLImage _img = new LVGLImage(LVGLImage.CfIndexed1Bit, 480, 640, _colors, image);
```

```
LVGLImage _img2 = LVGLImage.FromBitmap(loadBitmap(image), LVGLImage.CfIndexed1Bit);
```

```
return _img2;
```

```
}
```

```
}
```

```
}
```


3. Go back to the MAUI section, **Home.razor** and add the following code. The `OnInitialized()` will be called by the framework when the page is ready. Then, we register a listener to a message of type **UltraLiteOnTap** and write some text in a string to show we received it

```
string _eventText = "";
protected override void OnInitialized()
{
    WeakReferenceMessenger.Default.Register<VuzixSDK.Class.Event.UltraLiteOnTap>(this, (sender, e) => {
        _eventText = $"You have tapped {e.tapCount}.";
        StateHasChanged();
    });
}
```

```
<h1>Hello, world!</h1>
@_eventText
@if (MyMessage != null && MyMessage.Length>0 )
{
    <p>You wrote: @MyMessage</p>
}
```

We do the same for all the remaining events:

```
protected override void OnInitialized()
{
    WeakReferenceMessenger.Default.Register<VuzixSDK.Class.Event.UltraLiteOnTap>(this, (sender, e) =>
    {
        _eventText = $"You have tapped {e.tapCount}.";
        StateHasChanged();
    });

    WeakReferenceMessenger.Default.Register<VuzixSDK.Class.Event.UltraLiteOnDisplayOff>(this, (sender, e)
=>
    {
        _eventText = $"Display off event.";
        StateHasChanged();
    });

    WeakReferenceMessenger.Default.Register<VuzixSDK.Class.Event.UltraLiteOnDisplayOn>(this, (sender, e)
=>
    {
        _eventText = $"Display on event.";
```

```

        StateHasChanged();
    });
    WeakReferenceMessenger.Default.Register<VuzixSDK.Class.Event.UltraLiteOnDisplayTimeout>(this,
(sender, e) =>
    {
        _eventText = $"Display timeout event.";
        StateHasChanged();
    });
    WeakReferenceMessenger.Default.Register<VuzixSDK.Class.Event.UltraLiteOnPowerButtonPress>(this,
(sender, e) =>
    {
        _eventText = $"Power button press {(e.turningOn? "ON" : "OFF")}";
        StateHasChanged();
    });
    WeakReferenceMessenger.Default.Register<VuzixSDK.Class.Event.UltraLiteOnScrolled>(this, (sender, e)
=>
    {
        _eventText = $"Scrolled {(e.isScreenEmpty?"Empty screen":"Non empty screen")}.";
        StateHasChanged();
    });

}

```

At this point, you should be set to build your GUI as imagined. And display them on the glasses with ease.

Revision #2

Created 8 October 2024 21:09:40 by Tim

Updated 8 October 2024 21:34:05 by Tim