

WAYPOINT INDICATORS

C# NAVIGATION SYSTEM FOR UNITY

USER GUIDE

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When Starting a New Project

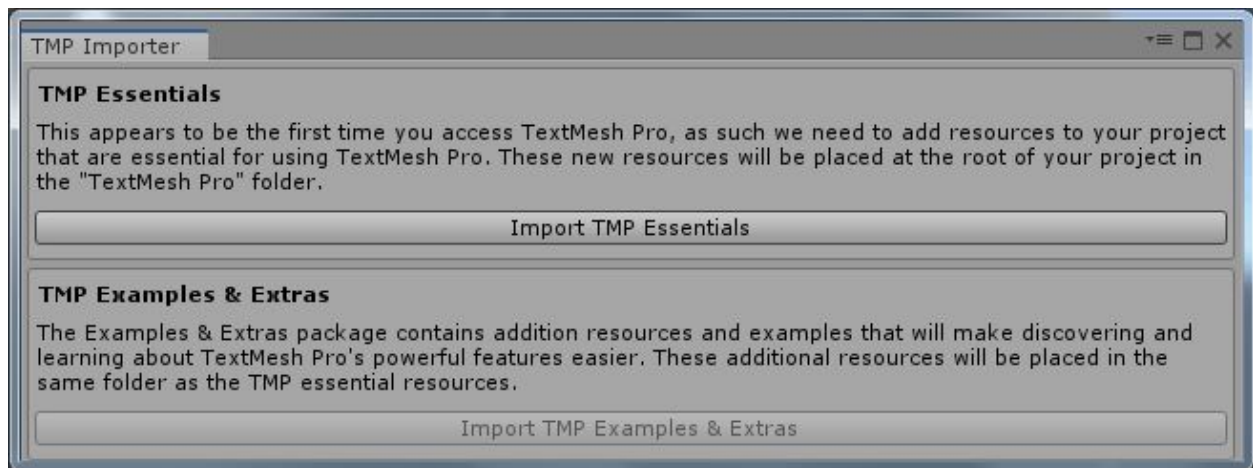
Select Your Project Resolution

This is an important step as your Canvas Reference Resolution will need to mirror this in order to track the waypoint's relationship with the edge of the screen.

From the Game tab (Window > General > Game) select the project workspace resolution (might say "Free Aspect" if this is a new project) and either select an existing resolution or declare your own by clicking the plus (+) sign at the bottom of the window..

Setup TextMeshPro (TMP)

If you try to run a new project with this script WITHOUT Text Mesh Pro, you will see this popup:



Click "Import TMP Essentials" to add Text Mesh Pro
No need to import Extras

TextMesh Pro provides improved control over text formatting and layout and this system uses it as a replacement for Unity's UI Text & Text Mesh. If you do not already have TMP Essential Resources installed, follow the instructions below:

1. Window > TextMeshPro > Import TMP Essential Resources
2. At the bottom of the popup window, click "Import"
3. For more on fonts, see "Adding Custom Fonts"

Add a Canvas

UI elements cannot display without a Canvas game object. Make sure you have one in your scene. To add a Canvas, from the top menu select: GameObject > UI > Canvas

If you plan on renaming your Canvas to something other than “Canvas” open the Waypoint Indicator script and update the “canvas_name” value in line 10 to the same name as your Canvas.

Setup Canvas

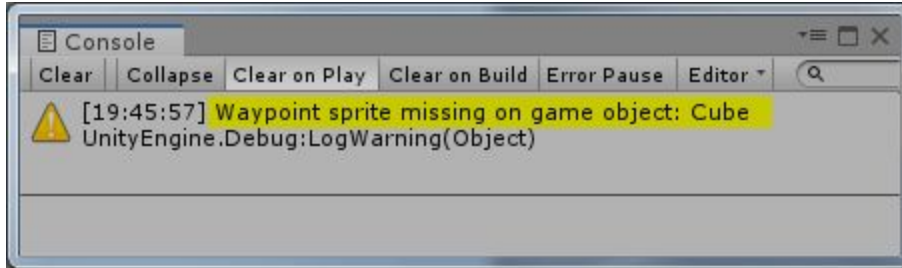
In order for the waypoint system to track accurately, it's important that your canvas is setup correctly.

To edit your Canvas, select it from the Hierarchy and find the Inspector window. If you do not see an Inspector window, click Window > General > Inspector

1. Canvas Inspector > Canvas > Render Mode > Screen Space - Overlay
2. Canvas Inspector > Canvas Scaler > UI Scale Mode > Scale With Screen Size
3. Canvas Inspector > Canvas Scaler > Reference Resolution > Same resolution as the project resolution selected in step one from the Game tab
4. Canvas Inspector > Canvas Scaler > Screen Match Mode > Match Width Or Height
5. Canvas Inspector > Canvas Scaler > Match > 0.5
6. Reference Pixels Per Inch > 100

Add the script to your game object

1. Select your game object and go to the Inspector
2. At the bottom, click “Add Component” and search “Waypoint_Indicators”
3. Click to add
4. Run the project
5. You should see two lines of text attached to your object.
 - a. The name of your game object
 - b. Its distance in meters
6. You should also see this Warning in your console:



- 7.
8. It just means you haven't added any sprites to your Icon On/Off screen states
9. If you do not see this, you might not have installed Text Mesh Pro or something's off with your Canvas settings. Please read above to make sure you have your project setup correctly.

How it Works

The Game Object and the UI Objects

Every Game object with a Waypoint script will spawn three UI objects into the Canvas at runtime. All three of these objects inherit their name prefix from the game object that spawned it.

1. Parent UI object (contains the Icon and Text UI objects)
 - a. Think of this as a container object to the Icon and Text objects. When the container's edges meet that of a screen edge, it tells the Icon and Text object to perform various actions that can be customized. For example swapping an on-screen icon with an off-screen version.
 - b. The container's dimensions can be customized for greater control. For example, if your icons are running up against the edge of the screen, add padding by giving more width to the parent container and moving the icon and text closer to the center.
2. Icon UI object (child of the parent UI object)
 - a. This accepts any graphic converted to a Sprite (See Converting Sprites for more)
 - b. Arrows/Pointers/POI Icons/Targets are good examples of image types
 - c. See Icon Options for additional details
3. Text UI object (also a child of the parent UI object)

Naming

Always be sure to uniquely name your game objects when using the Waypoint script. All UI objects inherit their name prefix from the game object that spawned it. If you plan to remove the game object and it's respective waypoint UIs later down the road, keep this in mind by not giving two different game objects the same name as results will be unpredictable and undesired. Here's a naming example for an object titled "Cube", you would see these three UI objects in your Canvas at runtime:

- Cube: wpParent
 - Cube: wplcon
 - Cube: wpText

The Waypoint Inspector

The Waypoint UI is broken down by a parent object containing two children:

Parent Object

- Icon Object
- Text Object

Parent Options

- Show Boundary Box
 - This acts as the waypoint's radius. It shows/hides the screen edge detection boundary box. When the edges of this box meet the edge of your screen, it is considered "off-screen". Turn this option on to visually see when your UI elements are being considered on and off screen. Icon and Text elements can be moved independently from this box. The boundary box cannot be disabled, only hidden.
- Boundary Box Color
 - Adjusts the fill color to easily display against various color backdrops. This color is set to transparent by default.
- Parent Size
 - Adjusts the width and height of the boundary box. This will not affect the size or positions of the children Icon and Text elements.
- Display Range
 - This is the distance between the main camera and game object at which to hide/display the indicator. Higher values will keep the indicator up longer as the camera moves further away.

Icon Global Options

- Enable Icon
 - Adds or removes the icon UI element completely from the Canvas. This is a performance saving option for Indicators that do not require an Icon element.
- Offscreen Rotates
 - Enables the off screen icon to rotate, point and follow the offscreen Game Object.

Icon On-Screen Options

- On Screen Sprite
 - The sprite image displayed while the target game object is on-screen, this replaces the Off Screen image.
- On Screen Size
 - Resizes the On/Off Screen image, bigger values make for a larger icon.
- On Screen Icon Offset
 - Moves the icon independently along the X and Y axis for precision positioning.
- On Screen Rotation
 - Alters the rotation angle of the on screen image.
- On Screen Fade With Range
 - Fades on-screen icons based off of the parent Display Range value. The further the player is, the more transparent the icon becomes and vice versa.
- On Screen Scale With Range
 - Scale on-screen icons based off of the parent Display Range value. The further the player is, the smaller the icon and vice versa.
- On Screen Hide
 - Completely hides the on screen state of the icon.

Icon Off-Screen Options

Same as the on-screen options but applied to the off-screen state.

Text Global Options

- Enable Text

- Adds or removes the text UI element completely from the Canvas. This is a performance saving option for Waypoints that do not require a Text element.
- Description
 - The name or descriptive text used to call out the game object. By default, the description value will be the name of your game object.
- Font
 - Adds a font face for your text. See Adding Custom Fonts for more info.
- Text Size
 - Adjusts how big or small your text will render. This value affects Distance Counter and Description text at the same time and cannot be changed independently at this time.
- Text Color
 - Changes the color of your font. Colors will affect both on and off screen text states and cannot be changed independently at this time.
- Text Align
 - Aligns both Description and Distance text to the left, center or right. Alignment is set to center by default.
- Text Line Spacing
 - Adjusts the leading or vertical spacing between multi-lines of text.
- Enable Description
 - Shows/hides the description text.
- Text Rect Width
 - Width of the Rect Transform UI text object. Increase this value if your letters/words are wrapping and you'd like them all on one line.
- Text Rect Height
 - Height of the Rect Transform UI text object. Increase this value if the height of your words have gone out of bounds due to size or character length.

Text On-Screen Options

- On Screen Hide Desc
 - Completely hides the on screen state of the description text.
- On Screen Hide Dist
 - Completely hides the on screen state of the distance counter text.
- On Screen Text Offset
 - Moves the text field independently along the X and Y axis for precision positioning.

Text Off-Screen Options

Same as the on-screen options but applied to the off-screen state.

Tips to Get Started

Use Empty Game Objects For Precision Positioning

Apply the Waypoint script to an empty game object, give it a unique name, then make it a child of the object you wish to track. This allows you to physically place the Waypoint where you like on the object. Waypoint scripts placed directly onto game objects will spawn at the object's local 0,0,0 origin points. Since every game object has a different origin point, this could yield unpredictable positioning results for your Waypoint.

Editing Waypoints on Prefabs at RunTime

When editing in RunTime, edit the script from the scene object directly, not the prefab resource file, your changes will not save. Instead, find and click the game object within the scene hierarchy and edit from there. When you're done, right-click the waypoint script, select "Copy Component". Stop running the project, right-click the waypoint script you just copied and select "Paste Component Values". This will make sure you don't lose your edits during runtime.

Stacking/Layering Text and Icon

Text and Icon UIs show up in the order that they are spawned. To place a UI object on top of another, simply disable, then enable it. Disabling text automatically disables the description and distance fields. You will need to re-enable them when re-enabling the Text UI.

Removing Game Objects and their Waypoints

Waypoints will destroy themselves when the game object or its parent is either destroyed or deactivated. Code below:

1. `Destroy(gameObject)`
2. `gameObject.SetActive(false);`

Adding Custom Fonts

Although not needed, custom fonts will help establish your game's look and feel. Here's how:

1. Locate the Project tab (Window > General > Project)
2. Create a *FONTS* folder in your assets folder.
3. Unity supported font formats: .ttf and .otf
4. Place supported fonts into the *FONTS* folder.
5. Open Font Asset Creator: Window > TextMeshPro > Font Asset Creator
6. Click "Source Font File" to select font.
7. Click "Generate Font Atlas"
8. Click "Save"
9. Your font is ready to use

Converting Images to Sprites

Although your project contains several sprite examples to experiment with, you may want to add your own.

The instructions below assume you already have icon art saved to your project.

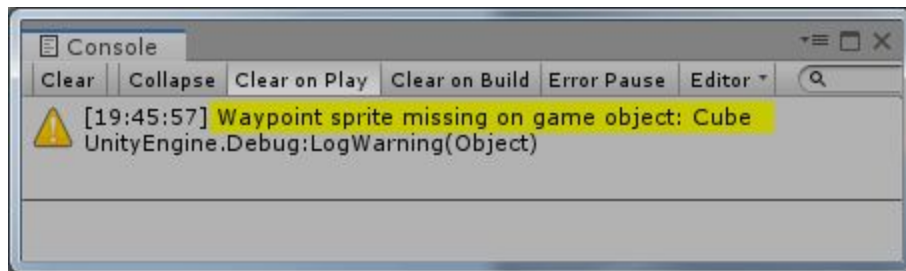
1. Locate your image in Unity via the Project tab (Window > General > Project)
2. Go to the Inspector Window (Window > General > Inspector)
3. Click "Texture Type" at the top
4. Select "Sprite (2D and UI)"
5. Click "Apply" in the bottom right
6. Your icon is ready to use

Customized Console Warnings

If your waypoint isn't working, check the console

In an attempt to go beyond the console log, detailed warnings for predictable situations have been added to facilitate speedier bug fixing. For example, if no sprites have been selected for the Icon, instead of seeing a white box, the console will tell you there are missing images and which game object its referring to.

Example:



FAQ

Show Bounding Box does not show up when clicking “Show Boundary Box”

The default alpha is set to 0. Click on Boundary Box Color to open the color wheel. Find the alpha slider (A), and slide it all the way to the right. Or type “255” in the value field.

Icon Object is not rendering on screen or spawning in Canvas when “Enable Icon” is checked

You might be missing sprites. Make sure you have sprites assigned to “On Screen Sprite” and “Off Screen Sprite” in the icon section.

“New Game Object” keeps spawning over and over outside of my canvas when project starts

This happens when there is either no Canvas in your project or your project Canvas is labeled differently than what the Waypoint script is looking for. Basically the script can't find the Canvas. To fix, open the Waypoint Indicator script and update the “canvas_name” value in line 10 to the same name as your Canvas.

Changes aren't updating in real time when the project is running

Make sure you are NOT updating the PREFAB from your project directory, this will yield no results. To see changes in real time, find and click on the Game Object with the Waypoint Indicator script attached either from your Hierarchy window or your scene view and edit directly from there.

How do I control the stacking order of text versus icons

Text and Icon UIs show up in the order that they are spawned. To place a UI object on top of another, simply disable, then enable the icon you want on top. Disabling text automatically disables the description and distance fields. You will need to re-enable them when re-enabling the Text UI.

Sprites look stretched

Disable and re-enable the game object with the waypoint script attached to fix. Do this each time you swap out your sprites with another sprite of a different width and height dimensions. The sprite size is set when the icon becomes enabled. If you swap out a sprite with another sprite of different width and height dimensions, the old values will still be applied to the new sprite and stretching will occur.

Contact

Questions, Comments, Concerns?

If you're having any issues at all with this script, please contact me. I'm not happy unless you are! Also, if the script is working out for you and you're super satisfied, I'd love to hear from you!

Click the contact link below to send me a message.

peter.tracy@yahoo.com

@studio_11508 | <http://ptracy.com/> | [Feedback Form](#)