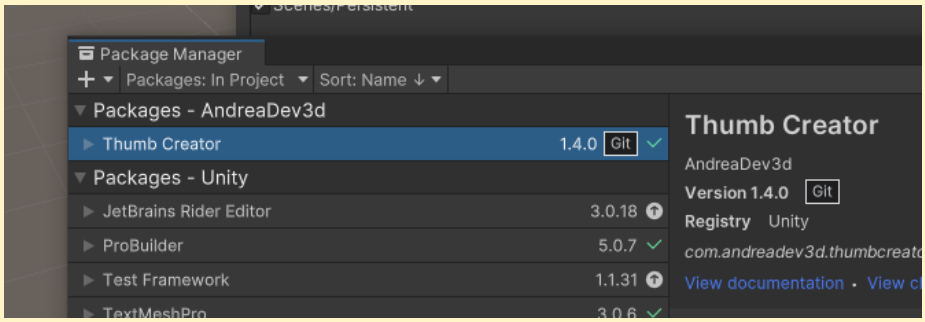
Labster Tools Documentation

About plugins

The free plugin **Thumb Creator** used to create icons automatically from Unity does not allow building the project (If a build is needed), for creating the build I just removed it from the installed plugins on the package manager. In some tested devices, this plugin is giving problems, so in case there is any problem regarding this plugin, I recommend going to the PackagaManager and removing it from the plugins in “In Project”.



Initial thoughts and direction

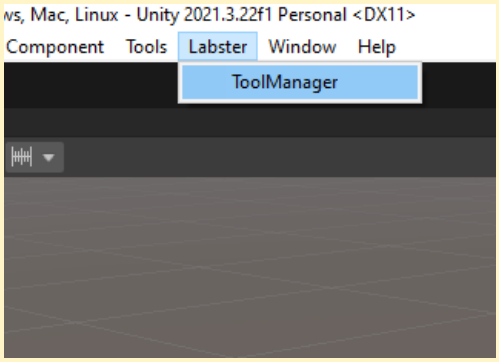
This project is aimed to create a set of tools that will allow a designer or user to create tracks, track pieces, cars and test everything easily. The two main ways I thought about the how to build the tracks was:

- Spline based track: Theoretically easier, with free tools available in the asset store.
- Grid based track: A lot more possibilities, but a lot more complexity.

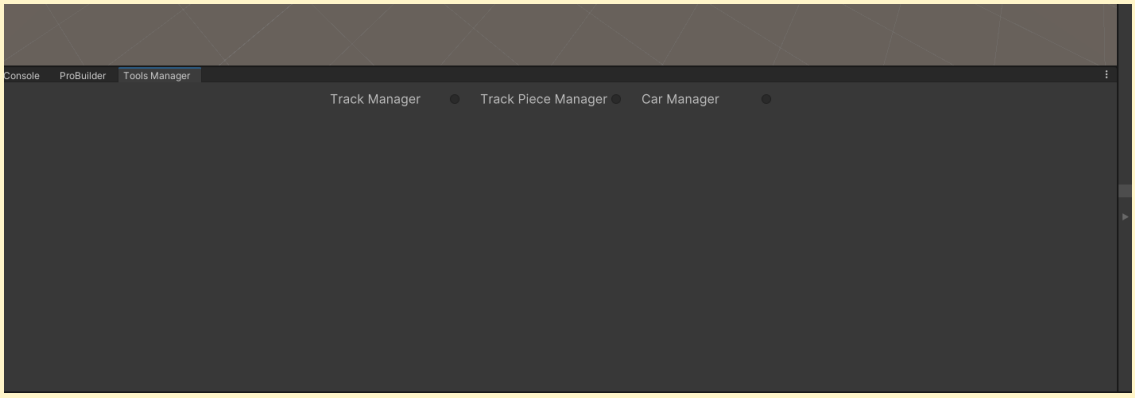
Even though splines seemed a lot more basic, I decided for a grid based track system, this way we will allow for a lot more combinations, tracks with multiple directions and possible multiple finishes and a lot more freedom for the future of the project.
Disclaimer: I understand that this is a test, but thinking about it as a real project with future projection seems the correct way for assessing the bases for it.

The Editor Toolset

In order to start using the editor tools, we have to open the Labster tools window:

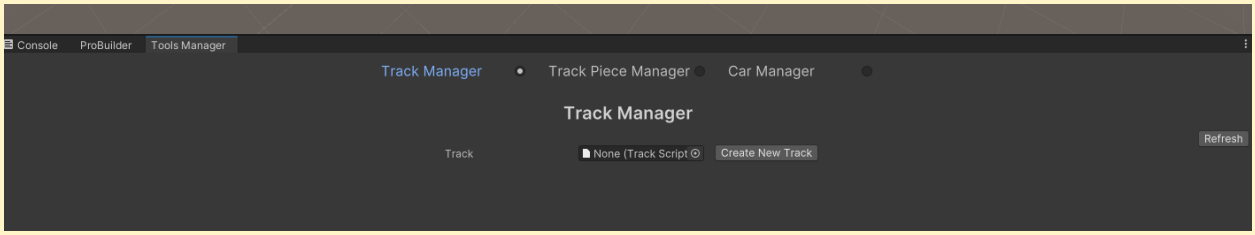


I recommend adding it to an horizontal window set, but should adapt to any shape, the ideal shape is 500x300px or more.



Track Manager

On the window we should press the button “Track Manager”, this will open the next submenu:

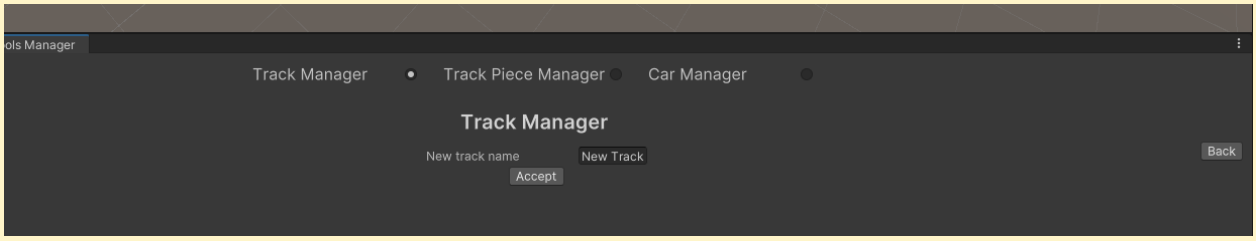


Here we can:

- Create a new Track pressing the button
- Refresh the window if we have changes on it
- Select or drag a track to start working on it.

Creating a new track:

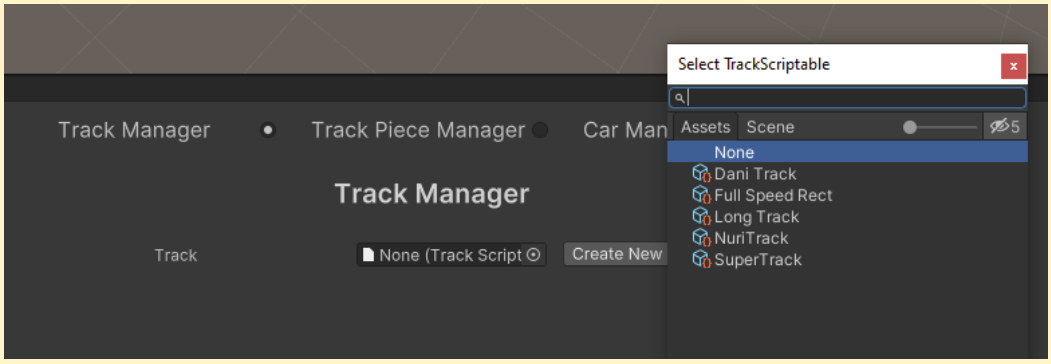
- We should press the button “Create new track” and the next submenu will appear



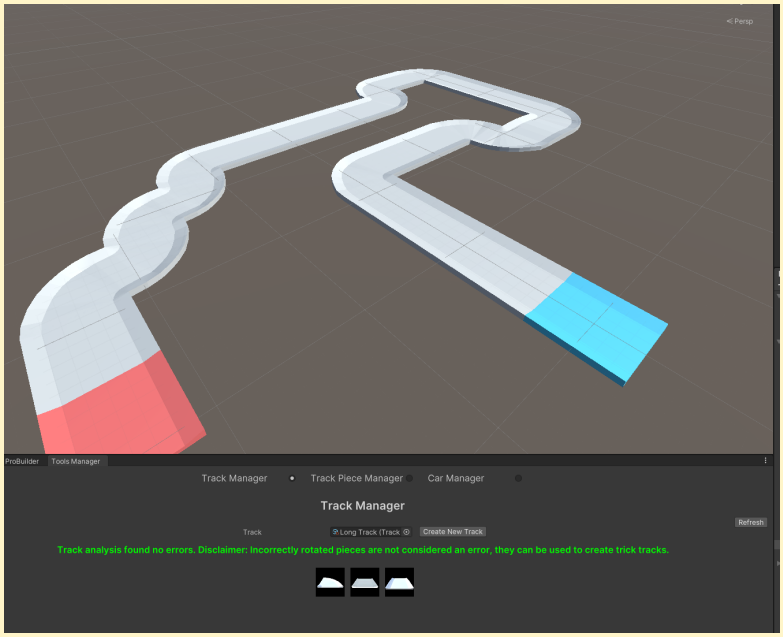
We can press"Back" to go to the previous menu or "Accept" to create a new track and select it. The track must have a non-empty name. If a track is created with an already existing name it will be overriden.

Working with the track

On pressing the circle on the Object Field called track, we will see a list of available tracks, the tracks created by this tool are immediately recognized.



After selecting a track, we will see the next menu:



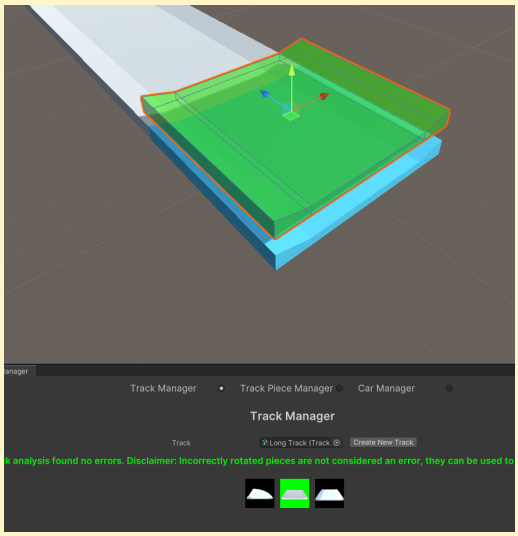
Small disclaimer: Sometimes Unity does not load the icons correctly after creating a new track, just use the button **Refresh** on the right of the Track Manager window and it should

display correctly.

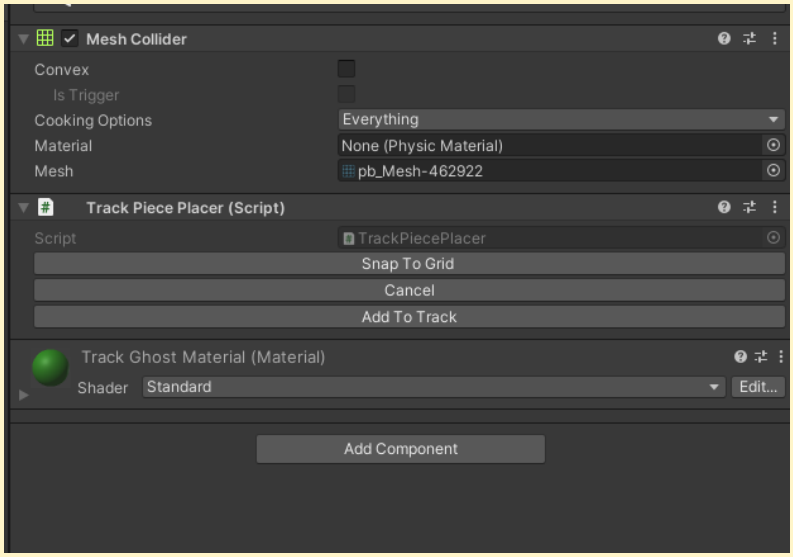
If we already have some data in the track, this will be loaded in front of us as seen in the image. On the window we can see in a grid all our available Pieces (3 in this case) and some feedback about the track analysis.

Adding pieces to the track

Once we press a piece, the piece will be created as a “Ghost” in green color. Will be created on the last changed piece position or in the center of the world if no data is available, the editor camera will automatically focus it:



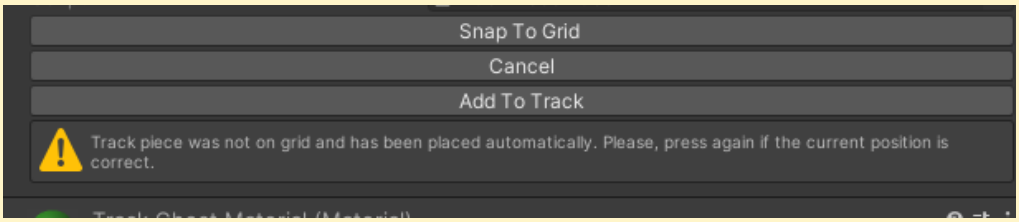
Note that we have signaled the current piece in the window in green too, also, the “Ghost” has been automatically selected. If we go to the inspector tab, we will see this window:



We have three buttons:

- **Snap to Grid:** Will center the piece on the nearest grid point.

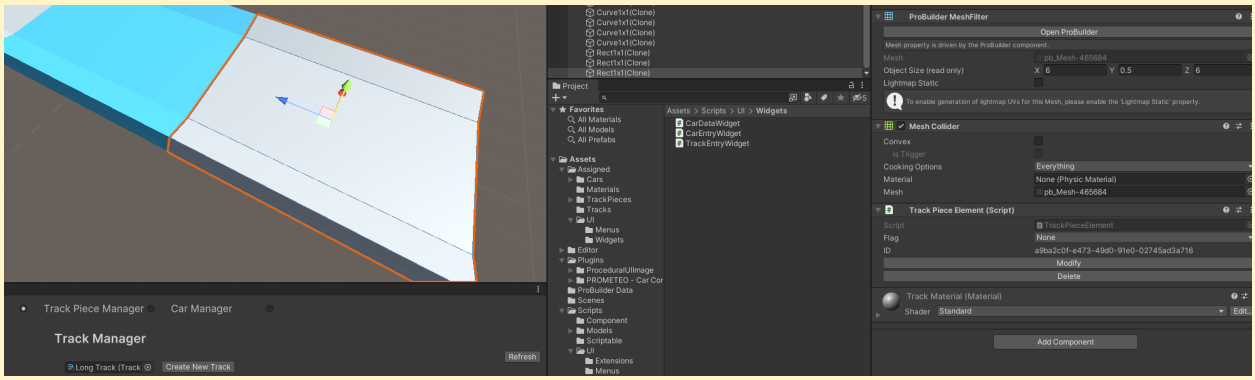
- **Cancel:** Will delete the piece and come back to the previous state.
- **Add To Track:** If the piece is not on grid will put it on grid and write an alert, otherwise will place the piece on the track and save it.
  * The alert should be this

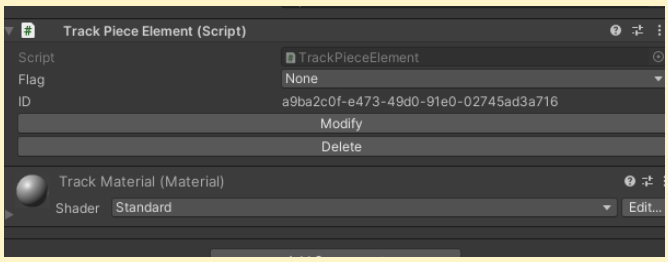


The grid consists in two calculus, a 6x6 meter tridimensional grid and a 90 degrees angle snapping.

Modifying pieces of the track

With our pieces in position, we might want to make some changes. After we selected a track, it was loaded on screen. (If we just finished the track, we do not need to close it and open it again) Now, we can select any piece on scene view and we will find a different component attached in the inspector:





In the component we will find two buttons:

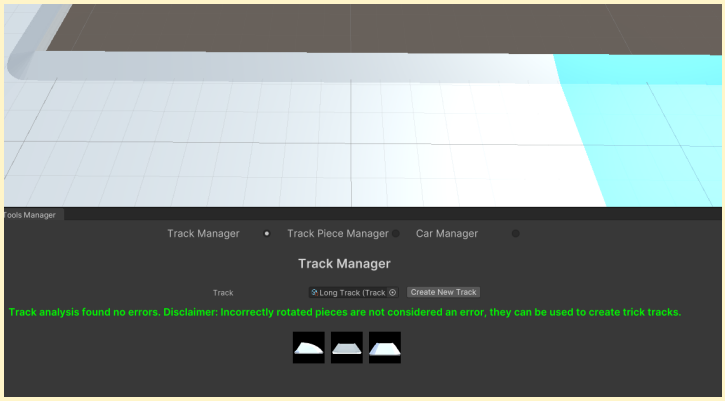
- **Modify**: This will apply all the changes we set on the Flag of this component, allowing us to set the Start and the End of the track (In the future a lot more flags could be added)
- **Delete**: Will remove this piece from the track.

Note that **Start** piece is **blue** and **End** piece is **red**.

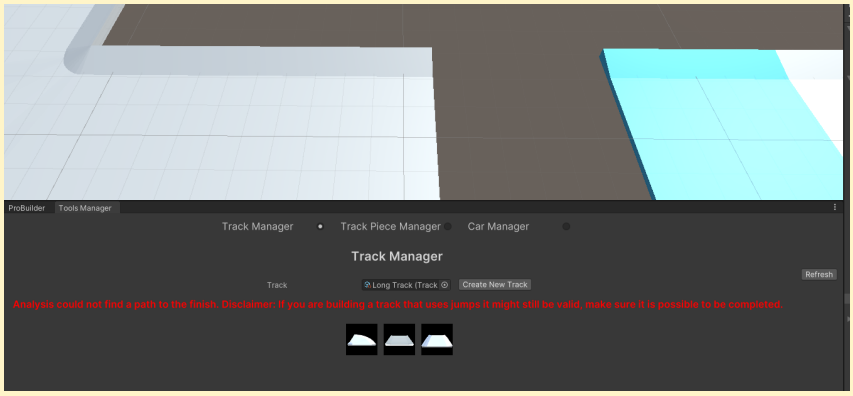
Track analysis

After a track is loaded or modified, an analysis is done for it, this analysis will try to detect the path from start to finish, if the track is complete and useful data to show about the track. It also gives feedback on the current state of the track and calculates which one of the currently created cars is optimal for the track.

The feedback will appear just under the grid in the track manager



And if we delete a piece in the middle…



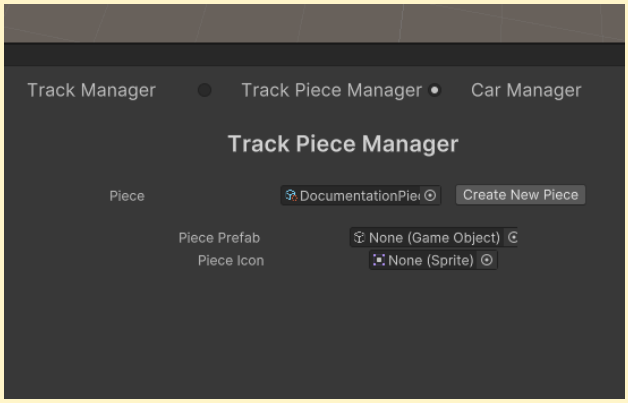
Track Piece Manager

Accessing the Track piece submenu is done by pressing the top middle button of the Labster Tools Window.

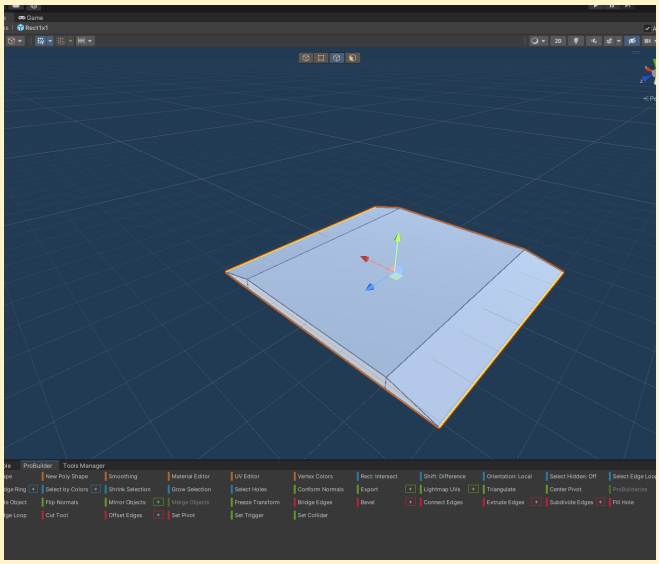
For creating a new Piece, please follow the tutorial on how to create a new track and apply it in the Track Piece Manager submenu.

A Prefab for the piece

For fully creating a piece, after we have created it, if we select it in the Piece Object Field of the menu, we will see this:



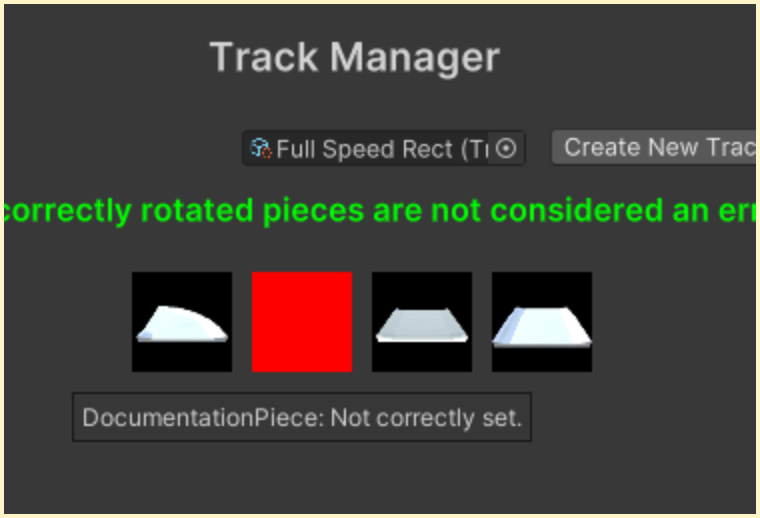
In order to create the prefab I recommend using probuilder, but any 3D model should work for it: The expected size in the current version of the tooling is 6x6 meters (6x6 Unity units), here is an example.



In the Track Piece Manager window with our piece selected, we will see a Piece Prefab object field, drag or select your prefab to it and it will be saved.

An icon for the piece

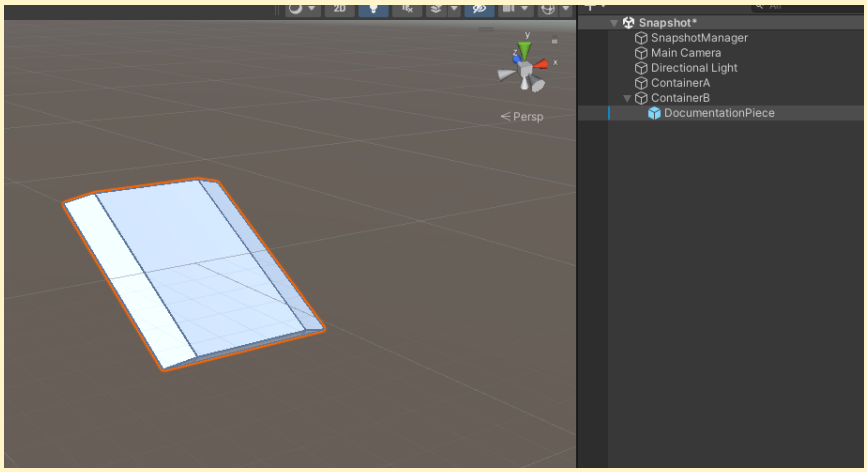
Similarly to the prefab, now we are going to create an icon (Sprite) for our Piece, if a Piece is not 100% correctly set, we will see this on the track menu grid:



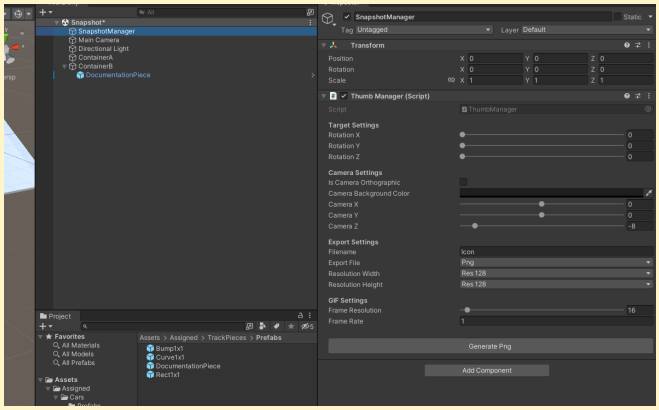
The red square will indicate the error and the highlight allows us to see the name of the piece.

For creating the prefab I use a free tool found on github called Thumb creator. I have set a scene called snapshot for it.

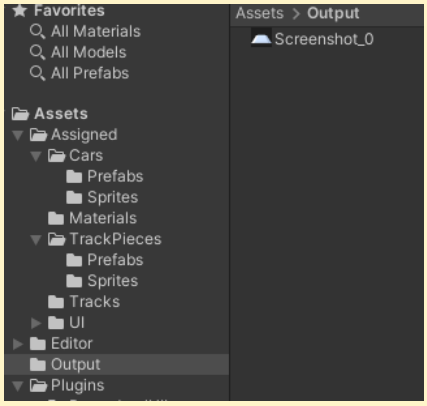
First, we go to the Scene called Snapshot



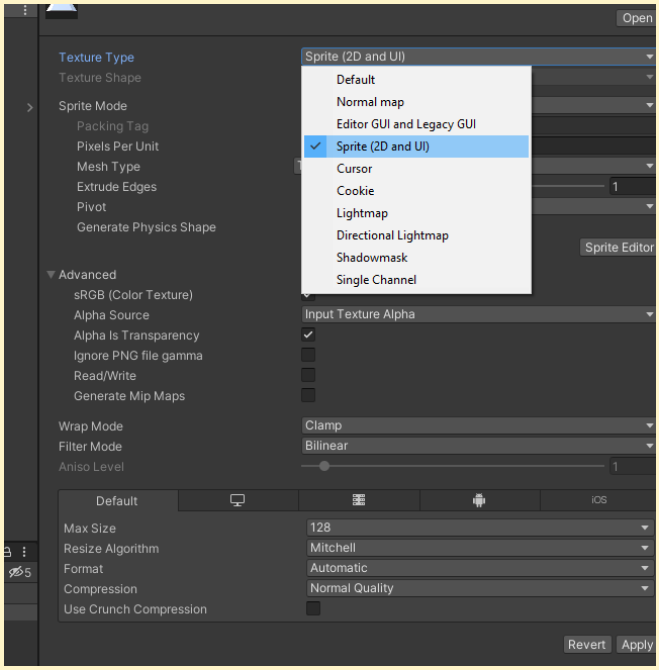
We can place our prefab on one of the containers ready to take the snapshot, after that, we should select **SnapshotManager** object in the hierarchy and press the button **Generate PNG** on its component: **ThumbManager**



After pressing, a new folder will be created if it does not exist, called Output, in there, we will find our icon



We should rename it to something it makes sense to us and make sure we set it to 128px and Sprite, see next image, do not forget to apply changes!



And now, we should assign this icon to the Track Piece Manager when selecting our piece, this should finish the creation.

Small disclaimer: Sometimes Unity does not load the icons correctly after assigning a new icon, just use the button **Refresh** on the Track Manager and should display correctly.

Car Manager

Accessing the Car submenu is done by pressing the top right button of the Labster Tools radio button group.

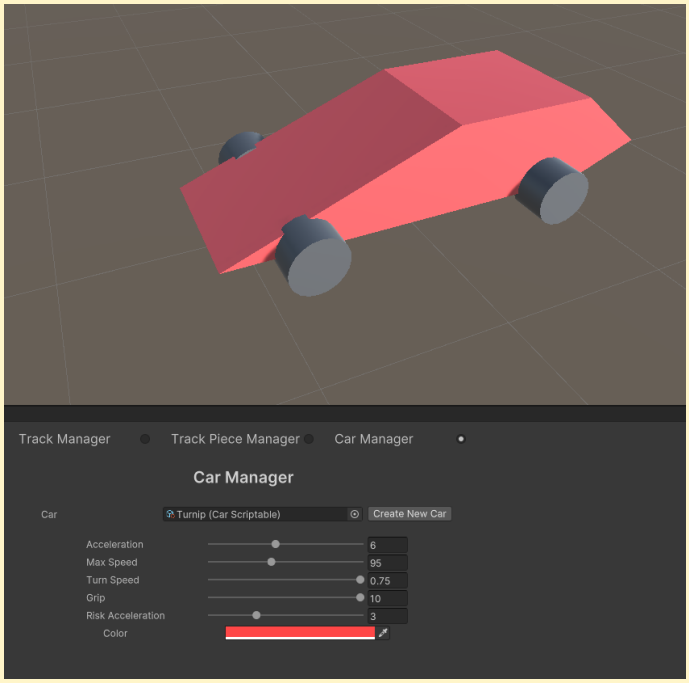
For creating a new Car, please follow the tutorial on how to create a new track and apply it in the Car Manager submenu.

Statistics for our cars

There are 5 statistics for the cars

- **Acceleration**: How fast the car accelerates, Goes from 0 to 100
- **Max Speed:** The maximum speed of the car, Goes from 75 to 125
- **Turn Speed:** The speed at which the car turns, Goes from 0.25 to 0.75
- **Grip**: How well the car takes the turns avoiding drifts, Goes from 0 to 10
- **Risk Acceleration**: This calculates if the car wheels on the left are at different height than the ones on the right on average, if so is considered a risk maneuver and will give extra acceleration. (This can happen on edges, jumps, or specific Pieces created by the designer.)

Cars do not need prefabs or anything else, but you can change the color for easy identification, so after setting the statistics and color, we are done.

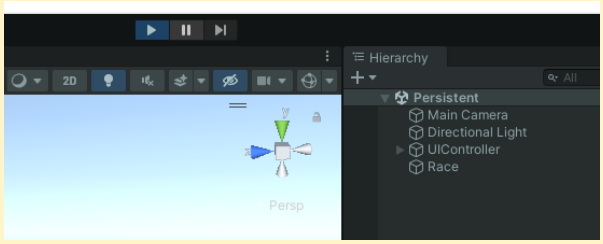


The car will be spawned when selected in the menu and the camera will focus it.

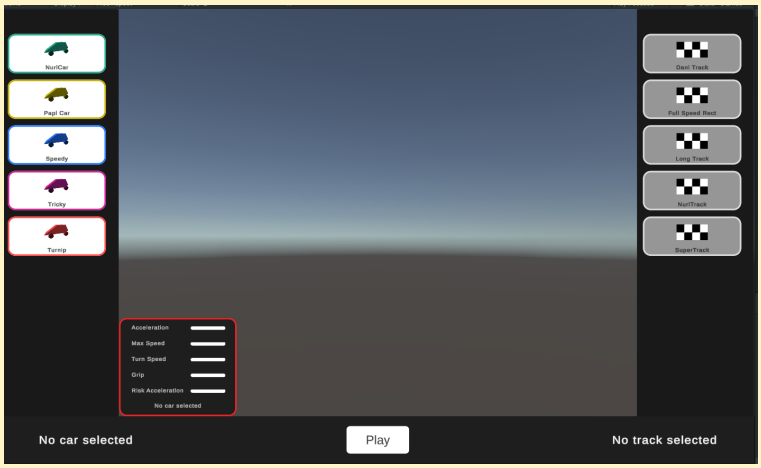
Next we will see how everything plays:

Playing and testing

For playing we have to go to the Scene “**Persistent**” and press play in Unity

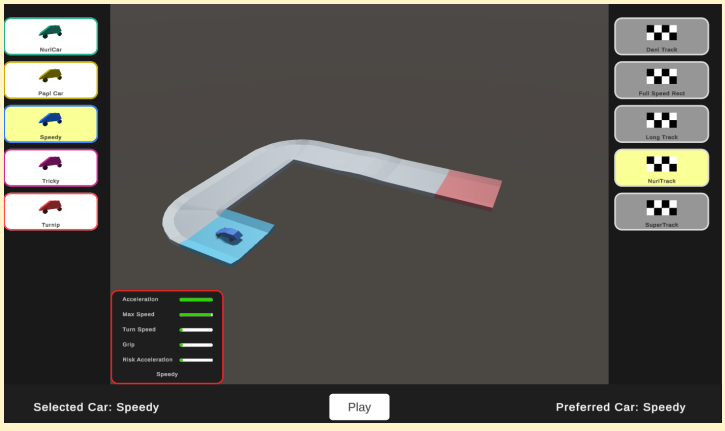


This is the menu we should see:



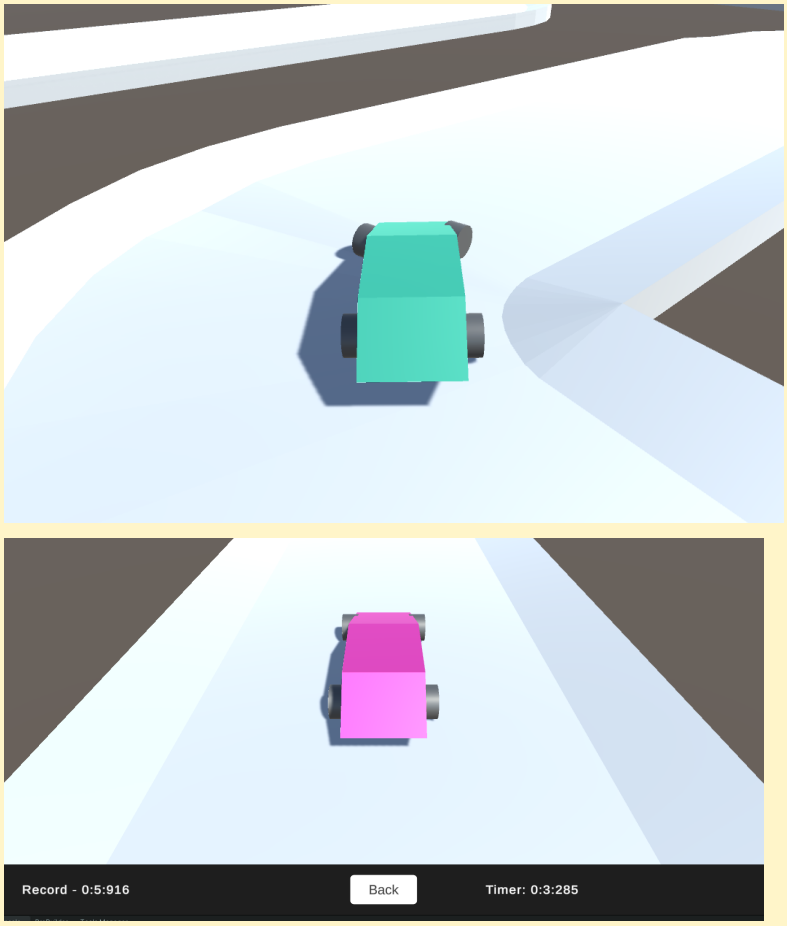
On the left, we will see the cars and the current selected car
On the right the current selected track and the theoretical best car for it.

Once selecting a Track we should see it in the middle
Once selecting a car, should be displayed at the start position of the Track and the statistics should be updated



We can try different combinations and, once we are ready, press the button play at the bottom of the UI

For moving we use:
W: Forward
S: Back
A: Turn left
D: Turn right



We can compete for the record in the track and go back to the previous menu at any moment, if we fall, we will be also sent to the previous menu.

For winning we need to get to the middle of the finish PIece (Red), this way, our record will be saved if it is the new best and we will be sent back to the menu.

Used Plugins

- **Pro Builder:** Unity Internal, for creating the Track pieces.
- **Procedural Image:** Bought years ago, for easy UI round edges and borders
- **Thumb Creator:** Free Asset, for creating icons from Unity.
- **Prometeo Car Controller**: Free Asset For an easy start point on the car Physics, has been slightly modified by me.

Links

Github: https://github.com/Palaui/LabsterTools