## 🎯 Purpose of This Setup Guide

This document outlines the required installation and configuration steps needed to successfully build and run Unity projects that include a custom tracking calibration implementation/plugin—specifically using Unity + SteamVR with the Null Driver for simulated VR environments.

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## 🛠 Unity + SteamVR Setup Guide To Run The MR Projects

### ✅ Install Unity Hub

Download and install **Unity Hub** from the official website:
https://unity.com/download

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### 🧱 Install Unity Versions

- 🔹 **Unity 2022.3.41f1**
  1. Open **Unity Hub**
  2. Add Unity version **2022.3.41f1**
  3. During installation, select the following modules:
     - **Microsoft Visual Studio Community 2022**
       - ✓ Desktop development with C++
       - ✓ Game development with Unity
     - **Download documentation**

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- 🔹 **Unity 2020.2.4f1**
  1. Open **Unity Hub**
  2. Add Unity version **2020.2.4f1**
  3. During installation, select the following modules:
     - **Microsoft Visual Studio Community 2019**
       - ✓ Desktop development with C++
       - ✓ Game development with Unity
     - **Download documentation**

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### 📦 Install Microsoft C++ Redistributables

Download and install the latest **C++ Redistributables** for **x64 architecture**:
https://learn.microsoft.com/en-us/cpp/windows/latest-supported-vc-redist?view=msvc-160

(Only the latest should be necessary, but in some particular cases may be needed a previous version)

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### 🎮 Install Steam and SteamVR

1. Download and install **Steam**:
   http://store.steampowered.com/about/
2. Open Steam
   - Go to the **Library** tab
   - Install **SteamVR**
3. (Optional) Open SteamVR and **copy lab computer configuration settings**, if necessary.

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### ⚙ SteamVR Configuration

Go to the path where Steam is installed, once there;

### 🔧 Modify steamvr.vrsettings

Path:
*Steam\config\steamvr.vrsettings*

Add or merge the following:

```
"driver_null": {
   "enable": true,
   "id": "Null Driver"
},
"steamvr": {
   "activateMultipleDrivers": true,
   "allowAsyncReprojection": false,
   "allowInterleavedReprojection": false,
   "allowSupersampleFiltering": false,
   "enableHomeApp": false,
   "forcedDriver": "null",
   "showAdvancedSettings": true,
   "showMirrorView": false
}
```

⚠ **Important:** Do **not** duplicate the "steamvr" entry. Just add/merge these parameters into the existing "steamvr" dictionary.

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### 🔧 Modify default.vrsettings

Path:
Steam\steamapps\common\SteamVR\drivers\null\resources\settings\default.vrsettings

Replace contents with:

```
{
   "driver_null": {
      "enable": true,
      "serialNumber": "Null Serial Number",
      "modelNumber": "Null Model Number",
      "windowX": 0,
      "windowY": 0,
      "windowWidth": 1920,
      "windowHeight": 1080,
      "renderWidth": 1920,
      "renderHeight": 1060,
      "secondsFromVsyncToPhotons": 0.01111111,
      "displayFrequency": 60.0
   }
}
```

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## 🔧 Post Setup – Environmental Parameter Adaptation

After completing the installation and configuration steps, you must adapt the project to match the **physical environment** and tracking setup. This is especially important for ensuring that the **tracking system** functions accurately.

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## 📐 Projection Calibration Adaptation

For projects that include the Tracking Calibration plugin, an additional parameter must be configured in the **DoublescreenCameraManager** script, located under the **Cameras** parent object. This parameter defines the camera overlap based on height, and you have two configuration options:

- **Percentage of Camera Overlap (Height-Only)**

  **Option 1:** Manually enter a value (from 0 to 100) representing the percentage of the map area that overlaps **vertically** between the projector space and the tracked physical environment. Ensure the **"Use Overlap File"** checkbox is **unchecked**.

  **Option 2:** Enable the **"Use Overlap File"** checkbox and provide the file path to a previously saved overlap calibration file. This file must have been created using a calibration project conducted in the **same physical environment** as the current one.

⚠ **Disclaimer:** The variable names in the project may differ from those listed in this guide, but they should be intuitive and easy to identify based on their function.