XR Interaction Toolkit

Demo

Launch scene `ImmersiveVRInventoryDemo\Scenes\XRToolkitDemoScene`

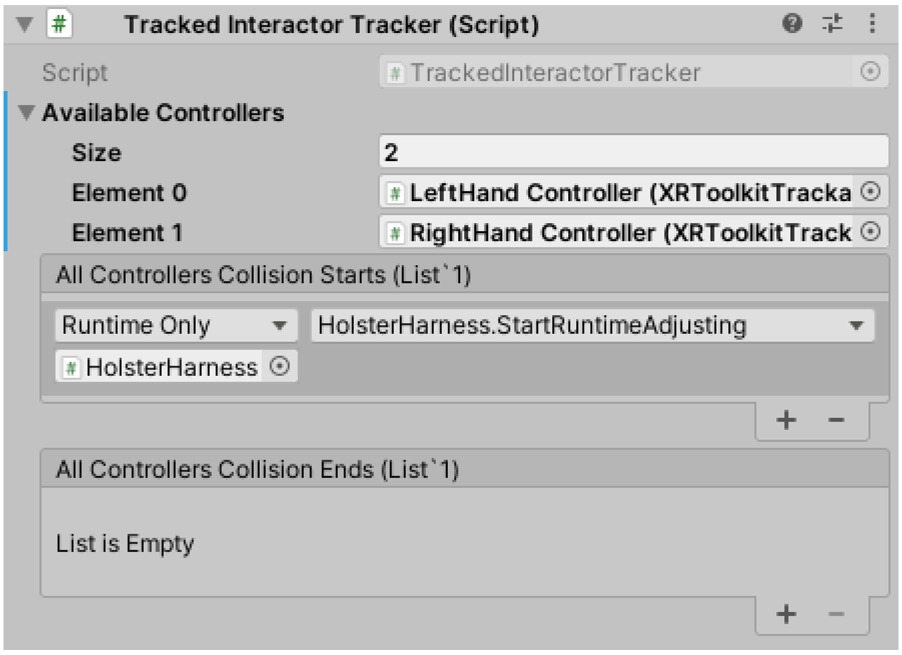
> After opening demo scene you could be asked to update TextMeshPro, if that happens you might need to reopen the scene for text to be correctly rendered

Setup

> As a prerequisite you need to:
>
> - enable Virtual Reality Support from `Edit -> Project Settings -> Player` menu
> - install `XR Interaction Toolkit` (preview 0.9.4)
> - start project with HDRP template (only for demo as it uses that scene materials)

When importing asset for clean build, only import `ImmersiveVRInventory`, `Editor/ImmersiveVRInventory folders` and integration code for framework used eg. `ImmersiveVRInventory/Integrations/XRToolkit`

1. Create `GameObject` and add `HolsterManager` script to it
2. Add `XRToolkitTrackableController` script to `GameObjects` with `XRController` scripts, eg.
   - `LeftHand Controller`,
   - `RightHand Controller`
3. On all instances of `XRTooltipTrackableController`
   - add new handler for `OnGrabStarted`,
     - put root `HolsterManager` as target object
     - choose function `HandleGrab (Dynamic)`
   - add new handler for `OnGrabStopped`,
     - put root `HolsterManager` as target object
     - choose function `HandleUngrab (Dynamic)`
   - assign `Controller` to current `GameObject` eg `LeftHandController`
4. Add `XRToolkitHolsterableItem` (or corresponding integration specific version) to items that you want to work with the system. **
5. Add `HolsterHarness` prefab to the scene, which includes backpack and side holsters
   - in `FollowObjectTarget` set `Source` to `GameObject` that tracks player position, eg. `MainCamera`
   - assign `TrackableController` (Left/Right) in `AvailableControllers` for `AdjustmentModeOn` and `AdjustmentModeOff`


Tracked Interactor Tracker (Script)

Script: TrackedInteractorTracker

Available Controllers
- Size: 2
- Element 0: LeftHand Controller (XRToolkitTracka
- Element 1: RightHand Controller (XRToolkitTrack

All Controllers Collision Starts (List`1)
- Runtime Only | HolsterHarness.StartRuntimeAdjusting
- HolsterHarness

All Controllers Collision Ends (List`1)

List is Empty

6. (Optional) - add `Backpack` prefab into the scene
   - Set `AutoHolsterSlotOnUngrab` on `HolsterableItem` to `HolsterHarness/BackpackSlot/Slot`

Microsoft Mixed Reality Toolkit

- to be added

Virtual Relity Toolkit

- to be added

Framework Independent Configuration

1. Add `TrackableController` scripts to controller objects
    - depending on integration used, eg
        - XRToolkit
        - MRTK Toolkit
        - VRTK Toolkit
    - you can also very easily extend `TrackableController` to work with your custom `Controller` implementation if not using any of the above
2. Configure `Grab` and `Ungrab` actions to flow into `HolsterManager` (depending on used framework - described in next section)
3. Add `HolsterableItem` (or corresponding integration specific version) to items that you want to work with the system
4. Add `HolsterHarness` prefab to the scene, which includes backpack and side holsters
    - attach it to game-object that follows player position
    - add `TrackableController` (Left/Right) for `AdjustmentModeOn` and `AdjustmentModeOn`
5. (Optional) - add `Backpack` prefab into the scene
    - Set `AutoHolsterSlotOnUngrab` to `BackpackSlot > Slot(Clone)`
6. (Optional) On `HolsterHarness` game object for `FollowObjectTransform` script set `Source` to headset following object (eg. for Unity XR - `MainCamera`)

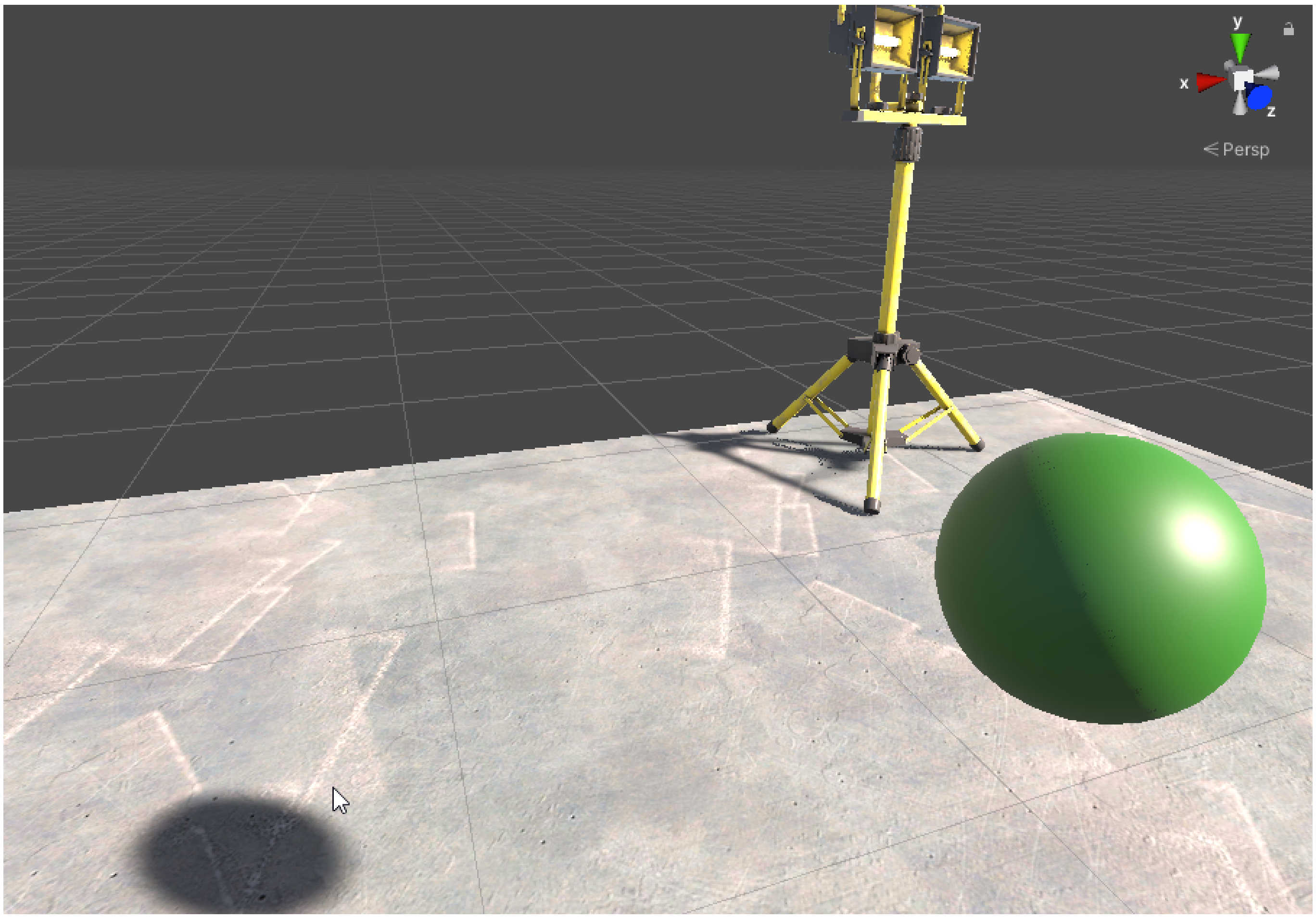
Now you'll be able to store all items with `HolsterableItem` script in any `HolsterSlot`

Play-mode customisation

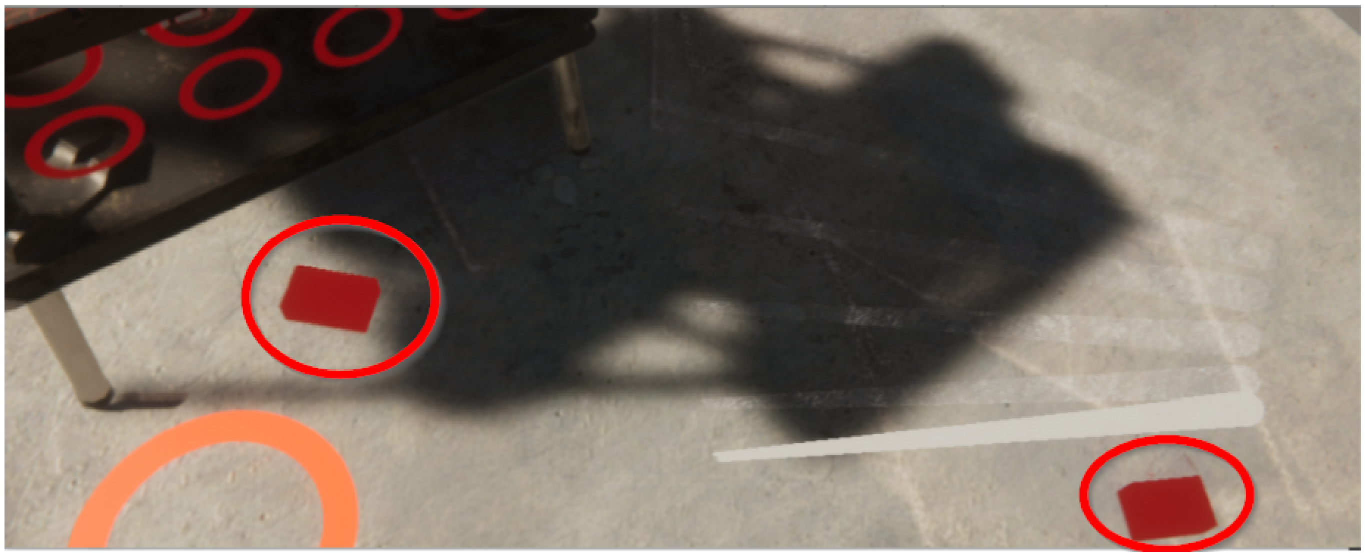
Holster slots positioning

Once you have your holster harness attached to camera you'll want to adjust their position for ease of use.

It's very convenient to do that in play mode using your headset and controllers. Simply put both hands on `AdjustmentModeOn` game object.



You'll see red-handles visible, simpt grab the one that interests you and place as needed. This will store new preferences. **To apply those new settings in Editor right click on** `HolsterSlotContainer` **(with play mode off) and choose** `Apply Holster Adjustments As Base`



Editor customisation

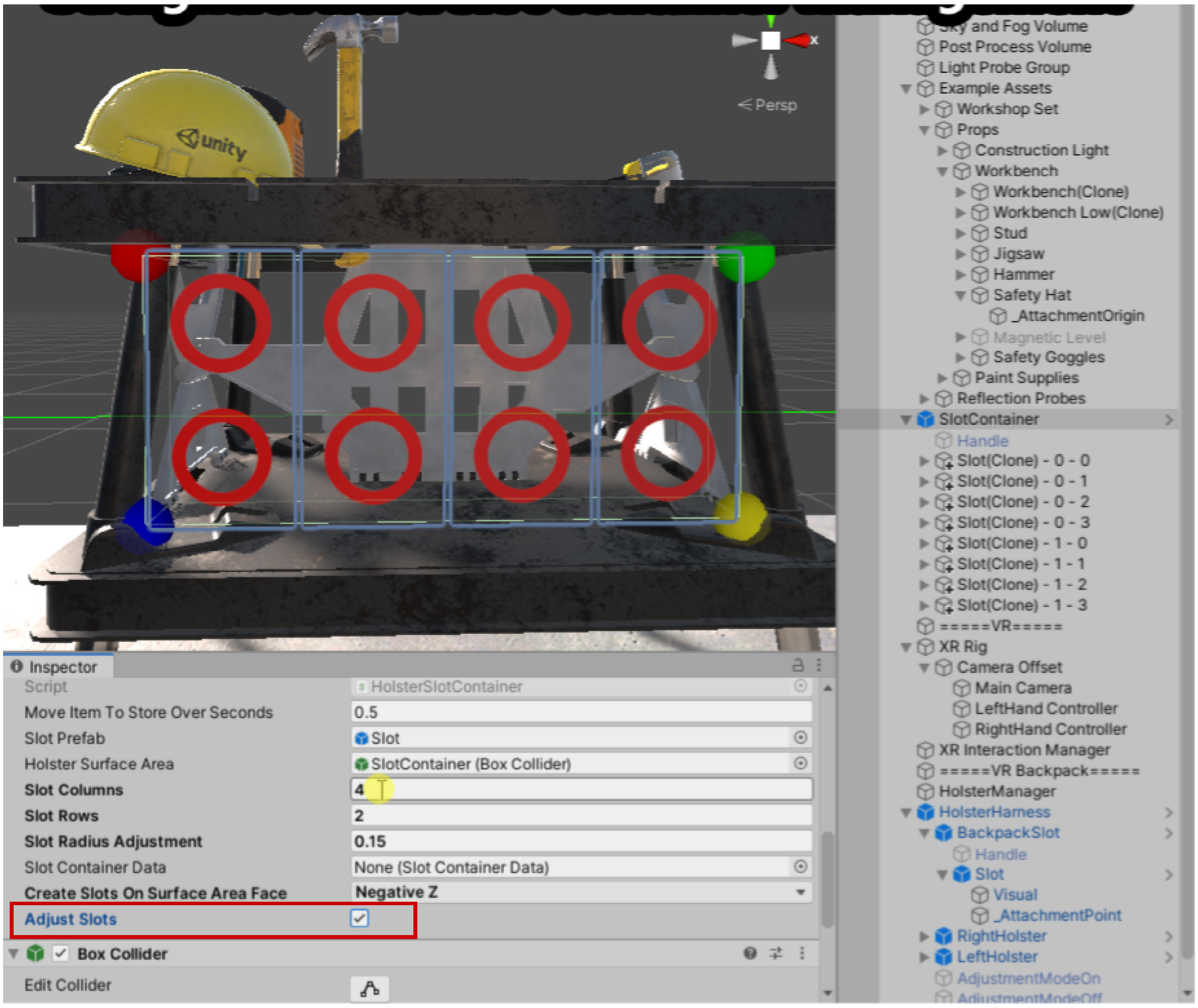
Holster Slot Container

Those can be used to create variation of slots in a grid with **n columns** and **n rows** and could be used to create various containers, eg:

- Backpack
- Waist Holster
- Chest Holster
- Back holster

Customisation

In edit mode select `Adjust Slots` which will reflect your changes in editor, it does so by recreating slot `GameObjects` changes you have done will be overwritten in that mode.



Script	HolsterSlotContainer
Move Item To Store Over Seconds	0.5
Slot Prefab	Slot
Holster Surface Area	SlotContainer (Box Collider)
Slot Columns	4
Slot Rows	2
Slot Radius Adjustment	0.15
Slot Container Data	None (Slot Container Data)
Create Slots On Surface Area Face	Negative Z
Adjust Slots	✓
Box Collider	✓
Edit Collider	

- Position - could be adjusted in play-mode and then applied in Editor via `Apply Holster Adjustments As Base`

- Holster Surface Area - box collider that will be used as a base to where put `HolsterSlots`
- Slot columns / rows - slots will be aligned in a grid based on available space while using columns and rows values to place components
- Slot Radius Adjustment - base radius for single `HolsterSlot`
- Slot Container Data - Scriptable object containg current data, those will be auto created with prefab or could be added using `Reset` via Editor
- Context Menu Actions
  - `Recreate Holster Slots` - will recreate slots based on setup, those can then be further customised as needed
  - `Apply Holster Adjustments As Base` - play-mode ajustments will be applied to scene data
  - `Persist Setup` - current adjustments will be persisted in scriptable object

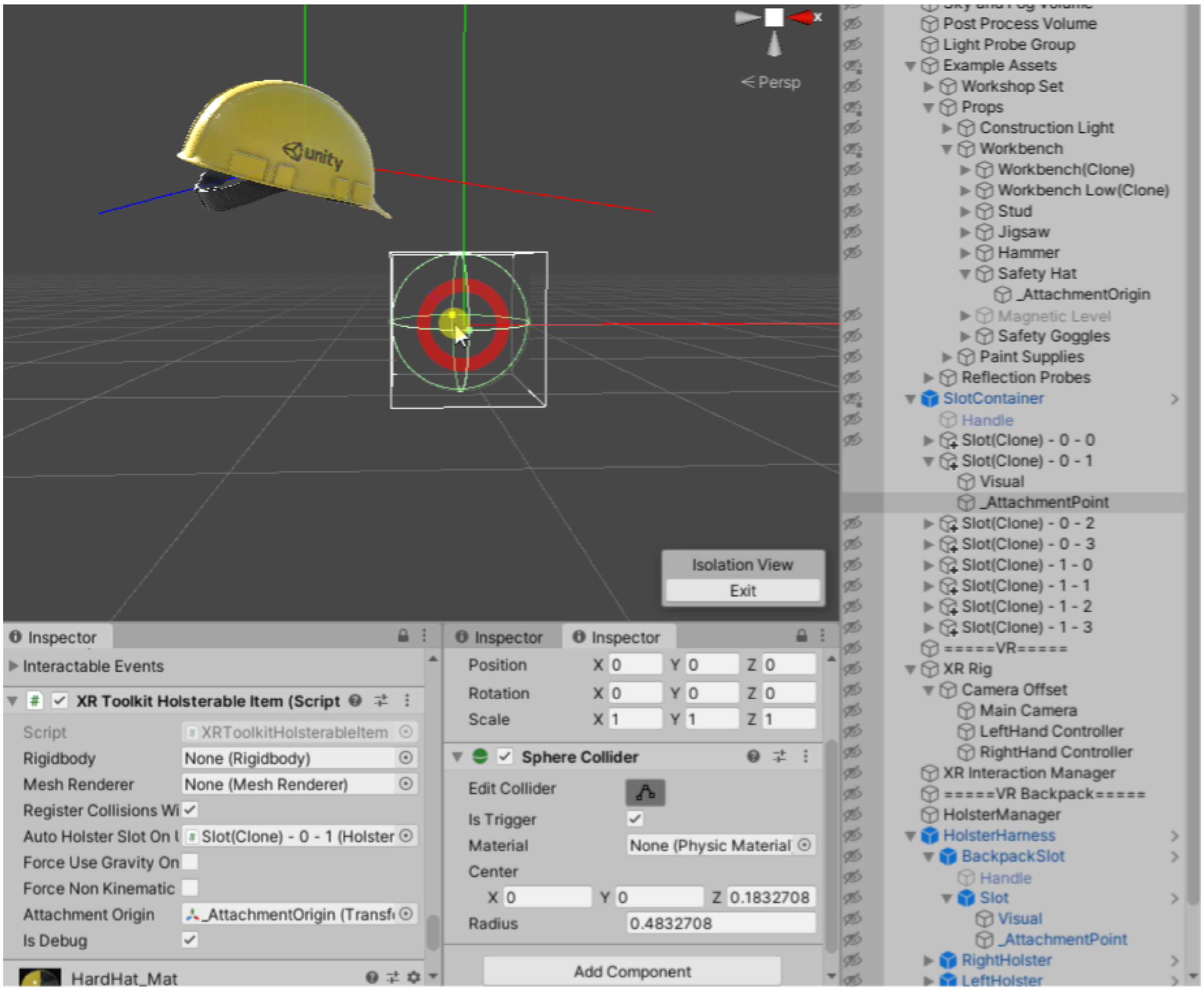
Holster Slot

Those elements directly store items put into them.

- Ring Radius Animation - animation curve that can be used to specify how ring radius will change when `Active`

Scaling

Items stored in slots will can adjusted to properly display in slot with `Scale Items To Fit` (this is useful for backpack-like containers)



Inspector
Interactable Events
XR Toolkit Holsterable Item (Script)
Script: XRToolkitHolsterableItem
Rigidbody: None (Rigidbody)
Mesh Renderer: None (Mesh Renderer)
Register Collisions Wi: ✓
Auto Holster Slot On I: Slot(Clone) - 0 - 1 (Holster
Force Use Gravity On:
Force Non Kinematic:
Attachment Origin: _AttachmentOrigin (Transf
Is Debug: ✓
HardHat_Mat

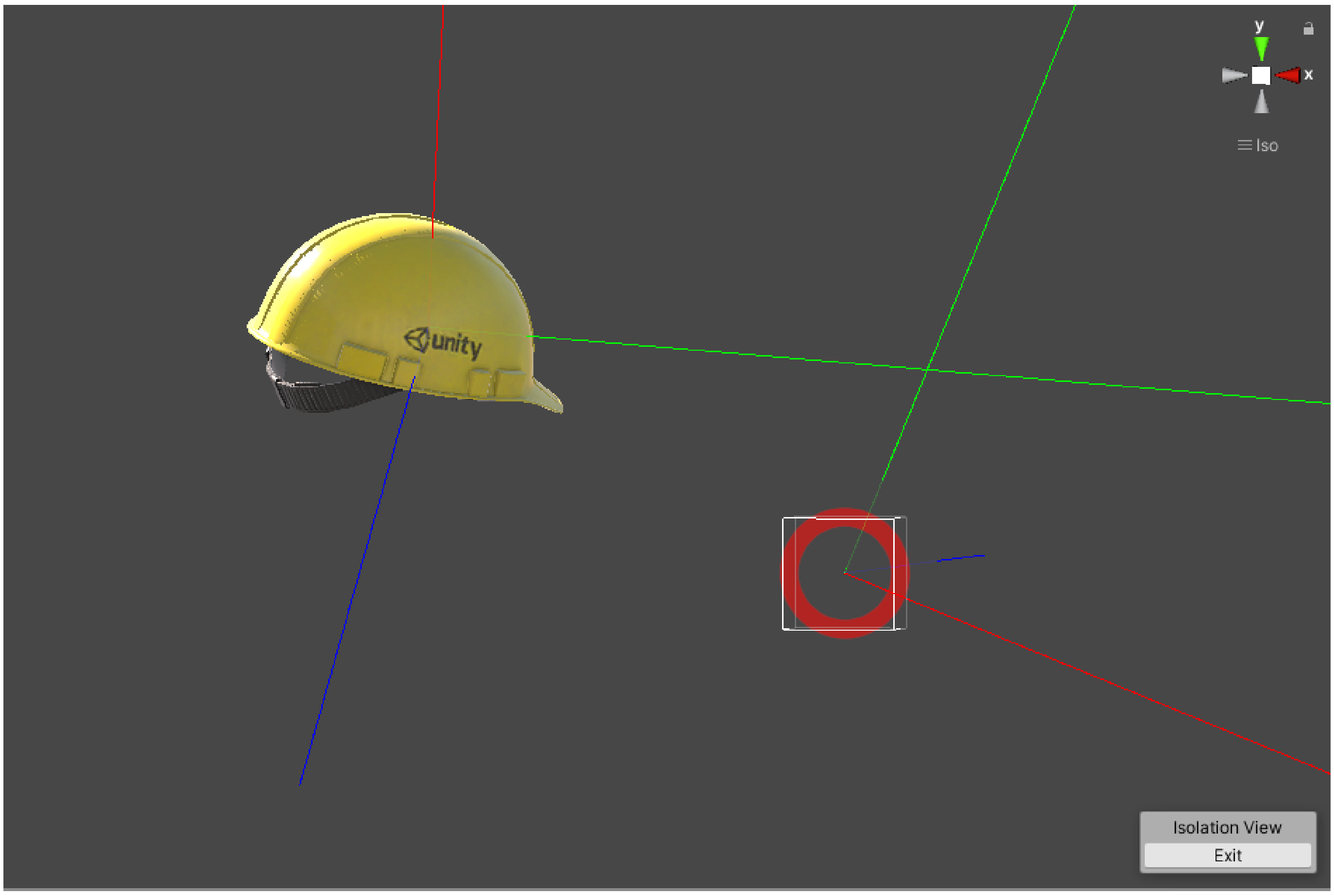
Inspector | Inspector
Position: X 0 Y 0 Z 0
Rotation: X 0 Y 0 Z 0
Scale: X 1 Y 1 Z 1
Sphere Collider
Edit Collider
Is Trigger: ✓
Material: None (Physic Material)
Center: X 0 Y 0 Z 0.1832708
Radius: 0.4832708
Add Component

```
Sky and Fog Volume
Post Process Volume
Light Probe Group
▼ Example Assets
  ▶ Workshop Set
  ▼ Props
    ▶ Construction Light
    ▼ Workbench
      ▶ Workbench(Clone)
      ▶ Workbench Low(Clone)
      ▶ Stud
      ▶ Jigsaw
      ▶ Hammer
      ▼ Safety Hat
          _AttachmentOrigin
      ▶ Magnetic Level
      ▶ Safety Goggles
    ▶ Paint Supplies
  ▶ Reflection Probes
▼ SlotContainer
    Handle
  ▶ Slot(Clone) - 0 - 0
  ▼ Slot(Clone) - 0 - 1
      Visual
      _AttachmentPoint
  ▶ Slot(Clone) - 0 - 2
  ▶ Slot(Clone) - 0 - 3
  ▶ Slot(Clone) - 1 - 0
  ▶ Slot(Clone) - 1 - 1
  ▶ Slot(Clone) - 1 - 2
  ▶ Slot(Clone) - 1 - 3
=====VR=====
▼ XR Rig
  ▼ Camera Offset
      Main Camera
      LeftHand Controller
      RightHand Controller
XR Interaction Manager
=====VR Backpack=====
HolsterManager
▼ HolsterHarness
  ▼ BackpackSlot
      Handle
    ▼ Slot
        Visual
        _AttachmentPoint
  ▶ RightHolster
  ▶ LeftHolster
```

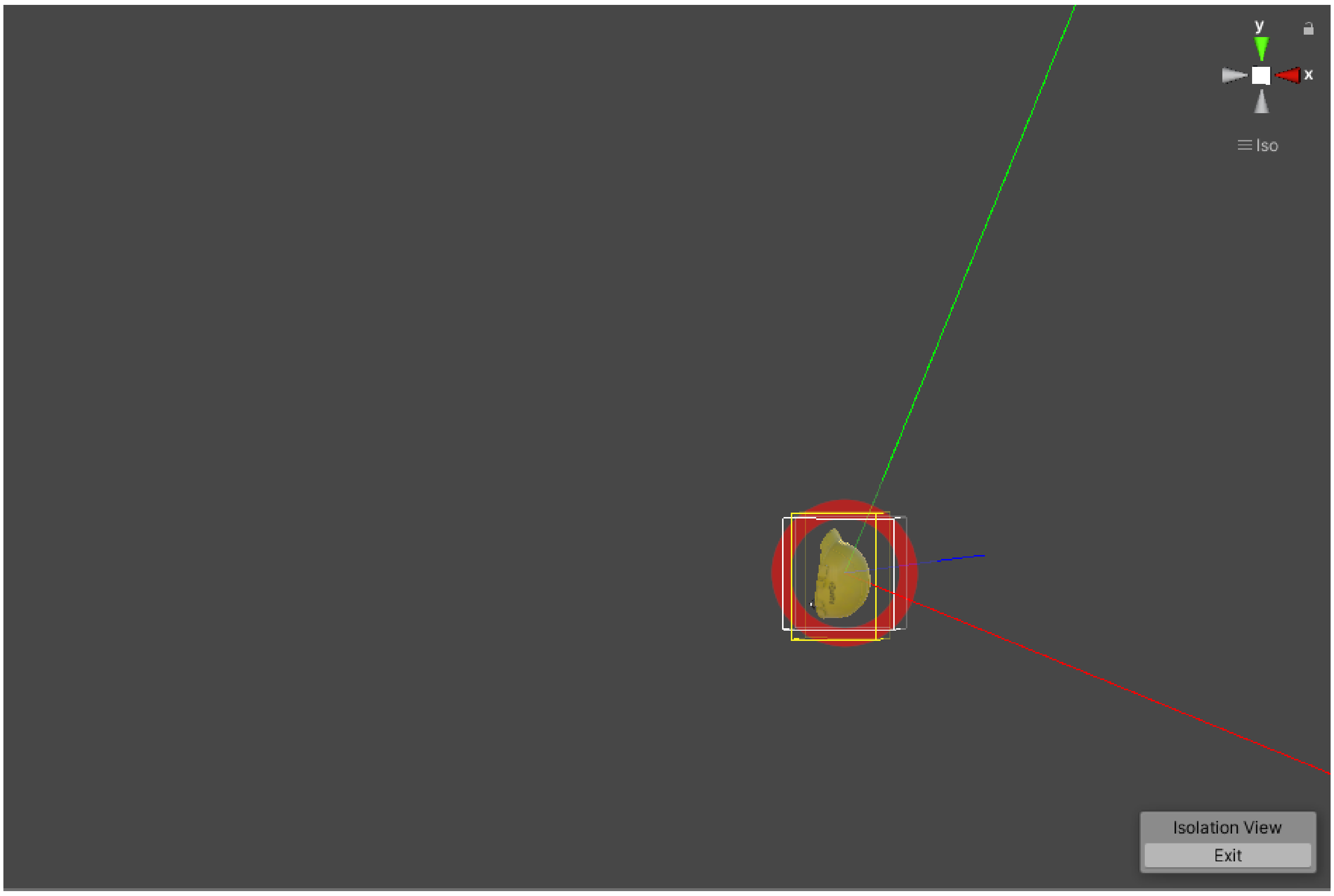
Rotation

When storing items, rotation can be adjusted to properly position within slot, this is very useful for side-holsters when storing single-items. For example a gun should be stored barrel down and grip back.

- `IsDebug` - will render up/forward/right directions for `_AttachmentPoint` (which are used to align with `_AttachmentOrigin` on `HolsterableItem`)
- `_AttachmentPoint` (child object) - change rotation directly to affect how `HolsterObjects` will be rotated when stored



When stored `Holsterable Item` will be rotated for direction lines to align.



Limit what can be stored

You can narrow down what can be stored in `HolsterSlot` with `LimitToItemsWithTag` - this will allow to only store items that are marked with specified tag.

HolsterableItem

This will allow game objects to be holstered / stored in slots.

- `_AttachmentOrigin` (child object) - change rotation directly to adjust how item should be rotated while holstered
- Auto Holster Slot On Ungrab - for some items it makes sense to auto store them when dropped, eg. Backpack should come back to back-holster when ungrabbed. This can be used for any items that user should not lose and have dedicated slot.
- Rigidbody / MeshRenderer - populated automatically and used to caluclate bounds when scaling items to fit within slot, adjust if complex models behave incorrectly
- Register Collisions With Tracked Controller - generally all items that you can put in `HolsterSlot` should register their collisions with `TrackedControllers`. The exception being items that can be stored in slots but are moved via `HolsterGragHandle`, eg. `Backpack` can be stored in another `HolsterSlot` (on the back) but should not register collistions as this will lead to invalid grab/ungrab mechanics.

Visual customisation

Asset is focusing on workflow, it uses minimalistic visuals that were designed to be easily replacable.

Holster Slot

When replacing shader please make sure it has access to `_RingRadius` variable, this is used to animate radius size changing to indicate items can be put in / out.

Holster Grab Handle

Red cube that indicates where container can be grabbed

Adjustment mode On / Off

Simple shapes that'll turn on adjustment mode when controllers are put inside of them.

Coming soon

- demo scenes with using different VR Frameworks - MRTK / VRTK
- ability to have multiple 'pages' in inventory