

Participants Application (Team of participants)

Started with a new scene and made a non-VR application which was then converted to VR using the SteamVR SDK and SVRA toolkit.

The application primarily made use of the simple scripts focused on grabbable objects and didn't include any more complex features such as the event bridge or interactive object scripts.

Instead the application made of the grabbable scripts (and highlighting system) and controller prefab (altering the controllers grip collision radius and buttons). Played around with making a custom highlighter effect by modifying the existing script.

Additionally used tested how the toolkit worked with a lot of the existing tools in Unity. The toolkit held up in this regard as they were able to modify the grabbable objects and world using existing Unity tools (changing the gravity of grabbable boxes, make one of the boxes oscillate in size, the shatter Gabe Newell wall into hundreds of smaller Gabe Newell cubes) and the SVRA toolkit didn't break and there were no compatibility errors with my toolkit and the existing Unity physics system, etc.

Also added some other effects such as water and particles and this too didn't break anything, showing that the toolkit integrates fine into Unity.

Participant: 1

0. Do you have a technical background?

- YES

CS student with significant experience working with Unity.

1. Have you done VR development before using other existing toolkits (VRTK, NewtonVR, etc.)

- NO

2. Would you use the toolkit again?

- YES

3. What is your initial impression of using the toolkit?

- Very Good (5)

4. How did you find the toolkit to use?

- Very Straightforward (5)

5. How did you find it to learn to use the toolkit?

- Very Straightforward (5)

6. Were you able to implement your intended application using the toolkit?

- YES

7. Where there any aspects you found particularly confusing or difficult to use?

- For SVRA, there was nothing, it was straightforward to use and integrated well with existing knowledge of Unity
- Understanding where and how to position the SteamVR Camerarig prefab was a little confusing at first (before experiencing it in VR) but once in VR it was easily repositioned

8. What additional features would you like to see included?

- A guide to using and positioning the SteamVR Camerarig prefab might have been helpful
- A script to attach to the floor so that if you walk off the platform you start falling or the game ends and you are asked to restart the scene

Additional Notes:

“I didn’t think it would be that easy”

Found it very straightforward to implement their intended application and were surprised with how few steps were required for setup / converting a non-VR application into VR application.

The participant was easily able to setup the scene and replicate tasks such as setup a controller or make an item grabbable and modify its parameters.

Found it easy to modify the highlight effects due to their experience scripting, were able to change the script to have their desired effect.

Participant: 2

0. Do you have a technical background?

- YES

CS student with some experience working with Unity.

1. Have you done VR development before using other existing toolkits (VRTK, NewtonVR, etc.)

- NO

2. Would you use the toolkit again?

- YES

3. What is your initial impression of using the toolkit?

- Good (4)

4. How did you find the toolkit to use?

- Straightforward (4)

5. How did you find it to learn to use the toolkit?

- Straightforward (4)

6. Were you able to implement your intended application using the toolkit?

- YES

7. Where there any aspects you found particularly confusing or difficult to use?

- Understanding how it all sort of fit together was a little confusing at first but once they had worked through the process of setting up a controller and grabbable object it became quite clear and straightforward to them
- A little overwhelming at first but once hands made a lot more sense
- The default to the grip for grab interactions was a little confusing at first but was fine once they became accustomed to using the grip buttons
- Unsure if they were able to throw a cube in the air and then catch it with the same controller as it seemed harder to do than they expected (though was shown to be possible)

8. What additional features would you like to see included?

- Possibly a set of walkthrough guide type things for getting started with SteamVR and the toolkit which also explain how it all fits together

Additional Notes:

Participant: 3

0. Do you have a technical background?

- NO

Some experience working with Unity.

1. Have you done VR development before using other existing toolkits (VRTK, NewtonVR, etc.)

- NO

2. Would you use the toolkit again?

- YES

3. What is your initial impression of using the toolkit?

- Very Good (5)

4. How did you find the toolkit to use?

- Very Straightforward (5)

5. How did you find it to learn to use the toolkit?

- Straightforward (4)

6. Were you able to implement your intended application using the toolkit?

- YES

7. Where there any aspects you found particularly confusing or difficult to use?

- Setup initially was a little confusing as they hadn't used SteamVR SDK before or knew how it worked but once everything was setup it was easy to work with the toolkit
- The name interaction action was slightly confusing before seeing an example such an action (the interact button example)

8. What additional features would you like to see included?

- An easy way to reset the world to its original state from within the game

Additional Notes:

Once everything was setup the participant found it easy to understand and work with the controller prefab and change the grab object button for example.

They were able to modify the grabbable items in the scene to have a snap effect and make them work with other Unity effects

Participants Application

Modified an existing scene (the target range scene) to include new grabbable objects and edited the attributes of existing setup scripts of the hovering targets (the SVRA_SnapZonObject script in particular) to make the target hover over a shorter distance at a greater speed.

Participant: 4

0. Do you have a technical background?

- NO

(No experience working with Unity before and very little coding experience)

1. Have you done VR development before using other existing toolkits (VRTK, NewtonVR, etc.)

- NO

2. Would you use the toolkit again?

- YES

3. What is your initial impression of using the toolkit?

- Good (4)

4. How did you find the toolkit to use?

- Straightforward (4)

5. How did you find it to learn to use the toolkit?

- Straightforward (4)

6. Were you able to implement your intended application using the toolkit?

- YES

7. Where there any aspects you found particularly confusing or difficult to use?

- There was a lot to grasp at first as it was the participants first time using both Unity and the toolkit and it was a little too much to begin with (this was more confusion caused due to the first time using Unity rather than the SVRA application)
- The similar names between the SVRA_GrabbableObject and some of the scripts used internally for the prefabs or behind the scenes required additional clarity.

8. What additional features would you like to see included?

- Scripts and examples showing off audio features. Both more novel uses of audio and more traditional uses of audio (the participant was very interested audio development for interactive and entertainment and wished to see that it was not overlooked in such development toolkits)

Additional Notes:

This participant opted to extend the existing target range scene rather than create a new scene as they were new to both Unity and coding.

Despite this the participant was able to add some new objects to the scene, successfully make them grabbable, adjust their physics behaviour and modify the existing objects within the scene.

For example within the range scene there are three objects setup to hover with the SVRA_ObjectSnapZone and SVRA_ObjectSnapZoneLocation scripts. The participant was able to modify the settings of the SVRA_ObjectSnapZone for one of the objects to make it hover a shorter distance, faster.

The addition and modification of new objects and the customising of existing scripts was done with minimal assistance required by the participant. That is the questions they asked were regarding Unity and working with it rather than the SVRA toolkit.

The main question they asked of the SVRA toolkit was regarding the names of scripts, in particular regarding the SVRA_GrabbableObject and SVRA_GrabPoint scripts, what the difference was and which they should be using to setup grabbable objects as it was not completely clear (and they didn't check the documentation).

The participant in general expressed an interest in audio and that aspect of making applications and so thought some examples showcasing novel methods of audio interaction or audio examples in general would make a good addition.

Participants Application

Participant experimented with the object playground scene by editing the attributes of the existing objects and adding some new grabbable objects.

Participant: 5

0. Do you have a technical background?

- YES (CS student with significant Unity experience)

1. Have you done VR development before using other existing toolkits (VRTK, NewtonVR, etc.)

- NO

2. Would you use the toolkit again?

- YES

3. What is your initial impression of using the toolkit?

- Very Good (5)

4. How did you find the toolkit to use?

- Straightforward (4)

5. How did you find it to learn to use the toolkit?

- Straightforward (4)

6. Were you able to implement your intended application using the toolkit?

- YES

7. Where there any aspects you found particularly confusing or difficult to use?

- There were some naming similarities between the prefab / internal scripts and the scripts to attach to objects
- The default setting for controllers for grabbing objects using the grip button rather than the trigger. The participant assumed it would be the triggers by default.
- Furthermore in regards to the controller prefab the logic of setting up a controller. In particular rather the participant felt that the logic should be reversed as currently you select the button associated with an action and they felt it should be you select the action associated with each button (see additional notes for further discussion)

8. What additional features would you like to see included?

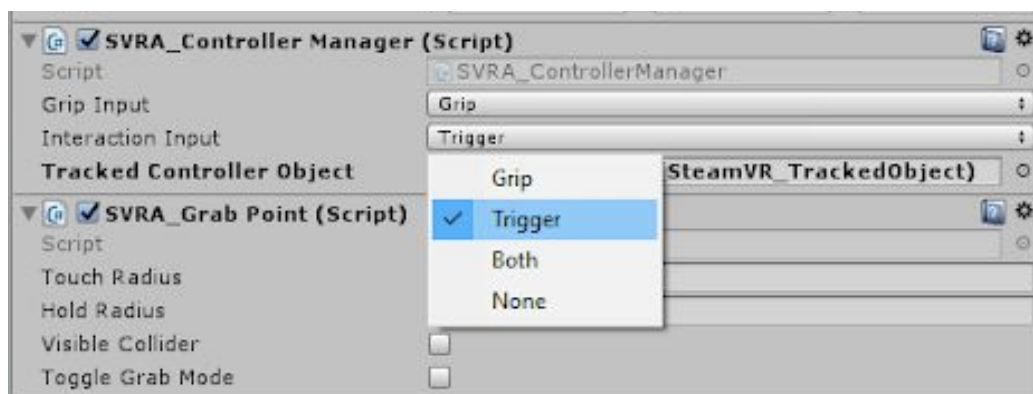
- Additional actions beyond grabbing and interacting. Things like an inventory system, teleportation system or to display a health bar or map.
- Switch the controller prefab logic to select action associated with button rather than current system
- Either hide or disable the scripts used internally only (hide them from appearing in the inspector AddComponent script list if possible). Alternatively rename them to make it obvious.
- Look into making custom Unity GUIs as you can do a lot of things with that

Additional Notes:

The lack of teleportation system was briefly mentioned as another feature and although the participant expressed an interest additional actions, teleportation being one of them, they commented that you are able to do a lot with a fixed play space.

Regarding to the controller prefab logic the user felt that it would be better if the logic was reversed from the current setup. They felt that the logic was that you were setting up the controller with the prefab and so you were then setting up controls of the controller (assigning the buttons) rather than making a connection between actions and buttons via the controller.

Currently the system has you select the button to trigger each type of action. That is you select the button used for grip actions and you select the button used for interaction actions.



(Picture included for additional clarity)

They believed the logic should be reversed so that you are presented with a list of buttons and for each button you pick the action to be associated with it. E.g:

<u>BUTTON</u>	:	<u>ACTION</u>
Trigger	:	Grab Object
Grip	:	Interaction
Touchpad	:	Teleporter

Joseph Post-Interview Comment:

In hindsight the above proposed system scales much better than the currently implemented system. For example as additional actions are added to the toolkit the list of inputs would get increasingly longer and not all might be used in a particular application. With the reversed logic system the list of buttons is fixed and the dropdown list of potential actions' size doesn't matter to the same extent.

I too prefer the logic of "setting up the controller and assigning what the buttons control"

Participants Application

Participant experimented with the object playground scene by modifying the play area in real time using the SVRA_PlayAreaModifier script while someone else was using the application, primarily to brainstorm what kinds of applications could be made to utilize that.

Participant: 6

0. Do you have a technical background?

- NO

No coding experience but some Unity experience

1. Have you done VR development before using other existing toolkits (VRTK, NewtonVR, etc.)

- NO

2. Would you use the toolkit again?

- YES

3. What is your initial impression of using the toolkit?

- Good (4)

4. How did you find the toolkit to use?

- Straightforward (4)

5. How did you find it to learn to use the toolkit?

- Straightforward (4)

6. Were you able to implement your intended application using the toolkit?

- YES

7. Where there any aspects you found particularly confusing or difficult to use?

- No but they avoided a lot of the interactive capabilities of the toolkit in favour of the altering the play area dynamically while a user was in the application

8. What additional features would you like to see included?

- Add the to alter the play area and camera via the controllers
- Possibly add additional scripts for controlling the camerarig, play area, etc.

Additional Notes:

The user strayed away from the more technical or code heavy aspects of the toolkit as their interest was in playing with the camera rig whilst a user was in an application.

Participants Application

This participant made a game which made use of both the grabbable object scripts, the interactive objects system (buttons in particular) and the event bridge. They went on to write their own logic and scripts, for example they wrote a timer script which they used the event bridge to setup with the button so that when the user interacted with the button a timer would go off. Their game was a simple puzzle room which was built off of the interact button example.

Participant: 7

0. Do you have a technical background?

- YES

Non-CS student but with some, not a lot, coding and Unity experience

1. Have you done VR development before using other existing toolkits (VRTK, NewtonVR, etc.)

- NO

2. Would you use the toolkit again?

- YES

3. What is your initial impression of using the toolkit?

- Good (4)

4. How did you find the toolkit to use?

- Straightforward (4)

5. How did you find it to learn to use the toolkit?

- Straightforward (4)

6. Were you able to implement your intended application using the toolkit?

- YES

7. Where there any aspects you found particularly confusing or difficult to use?

- The event bridge was a little confusing at first but working through the simple example scene they eventually believe they got an understanding of how it worked
- Participant had never installed a Unity asset directly from a repo and got confused slightly by that

8. What additional features would you like to see included?

- Some more simple example scenes like the target range and button which show off some of the other features such as the projectile firing system, all of the attributes and modifications that can be made to grabbable objects and the controllers, etc.
- Possibly also some more “game-like” scenes. That is very small scope games as example scenes. Add a scoring system to the target range, etc.
- Not a feature but perhaps a video tutorial type of thing demonstrating building very simple applications
- Also asset store publication for easier installation

Additional Notes:

The participant didn't struggle with the setup of the controllers and making objects grabbable.

They were initially a little confused by the event bridge system but working through a simple example and the tutorial sheet on the repo helped clear that up with a little assistance from me. With some assistance initially to explain some of the finer details of the event bridge they were able to work independently with only minor pieces of assistance along the way.

Participant Application

The participant's desired application was reliant on teleportation which was not included in this iteration of the toolkit. The participant looked into the potential

Participant: 8

0. Do you have a technical background?

- YES

Coding and Unity experience

1. Have you done VR development before using other existing toolkits (VRTK, NewtonVR, etc.)

- NO

2. Would you use the toolkit again?

- NO (not until teleportation was included)

3. What is your initial impression of using the toolkit?

- Neutral (3)

4. How did you find the toolkit to use?

- Neutral (3)

5. How did you find it to learn to use the toolkit?

- Neutral (3)

6. Were you able to implement your intended application using the toolkit?

- NO

7. Where there any aspects you found particularly confusing or difficult to use?

- The participant was unsure of how it would work with the SteamVR SDK. That is they attempted to mix the two systems to make use of the SteamVR teleportation system but did not succeed.
- Aside from that making a grabbable object scene seemed simple enough based off the included example scene.

8. What additional features would you like to see included?

- A teleportation system
- Better details / example scenes on how to make a hybrid application that makes use of both the SteamVR SDK prefabs and scripts and the SVRA scripts

Additional Notes:

The participant felt that the SVRA toolkit was simple enough to understand but could not achieve their desired functionality with it. They understood how to make simple grabbable examples but they wished to make an application that was reliant on teleportation and could not do that with this application easily.

Participants Application

Participant created a floating platform and setup some grabbable objects on the platform with varying textures and effects applied onto them.

Participant: 9

0. Do you have a technical background?

- YES

Coding experience with little Unity experience

1. Have you done VR development before using other existing toolkits (VRTK, NewtonVR, etc.)

- NO

2. Would you use the toolkit again?

- YES

3. What is your initial impression of using the toolkit?

- Good (4)

4. How did you find the toolkit to use?

- Straightforward (4)

5. How did you find it to learn to use the toolkit?

- Straightforward (4)

6. Were you able to implement your intended application using the toolkit?

- YES

7. Where there any aspects you found particularly confusing or difficult to use?

- None

8. What additional features would you like to see included?

- Add the to alter the play area and camera via the controllers
- Possibly add additional scripts for controlling the camerarig, play area, etc.

Additional Notes:

None, this was an early interview in the timeline of interviews conducted hence the absence of as much feedback as the other