Test Decisions

For the test team this ID a large focus was placed on obtaining a complete working copy of a test smoke, that could run automated tests to verify the system in different ways such as smoke tests. There were two contending ways to implement this testing, the first being implementing some type of hooks that would allow us to get different information from the system as it was running. The second way would be to take the open source code from Meta, and grab their simulator that can communicate with chromium and create our own test harness.

The decision was discussed early on in the ID, and the team felt that it would make the most sense to use a test hook style of software testing to then verify the final solution of the system. Matthew did look into possibly creating a test harness but the complexity of not only using their simulator but to then incorporate that into a custom setup of something such as playwright was deemed far fetched for the time constraints given for implementation. Meta's WebXR emulator uses browser signaling to interact with a WebXR instance running in the browser. Harnessing these signals to run programmatically driven tests look promising, however writing a full VR testing harness at this point in the term would decidedly not yield as much value as the custom log-based test hook method at this point in the term.

We went with writing our own test hooks, this allows the tester to communicate with the dev team to get pre-written statements that can then be stored while someone walks through the application. These statements can then be obtained when the developer enters the test mode of the application so that it does not store any of this data outside of development using environment variables.

To get the entire team on board and caught up, there will be a quick meeting early next week so that the team can run these smoke tests before any new pushes are made into the code base.

Manual Test Results

These results are dated as there were 3 recordings that occurred post ID meeting with DR. Osgood. To make it easier for reading There will be comments above the different days with any changes. The final tests were performed on both the simulation and the physical meta quest to verify the implementation on the device.

Tuesday March 12

Test ID	IssueID	FeatureName	Intent	Pass / Fail	Iderati on #	Notes
1	#61	WebXR spike	Loading WebXR through Quest Browser	Pass	1	
2	#61	WebXR spike	Launch Quest Through Firebase Host	Pass	1	
3	#61	WebXR spike	Meta Quest Controls interact with spike	Pass	2	ID1, Found some Converns with controlls notr releasing as Expected
4	#61	WebXR spike	Spike Responsitivity	Pass	1	
5	#61	WebXR spike	Quest Can Enter VR Mode	Pass	1	
6	#100	FixedJest		N/A	2	
7	#100	FixedJest		N/A	2	
8	#100	FixedJest		N/A	2	
9	#10	Importing From a CSV	CSV buttons become visible to the user	Pass	2	
10	#10	Importing From a CSV	Loading CSV from URL	Pass	2	
11	#10	Importing From a CSV	Loading CSV from local files system	Pass	2	
12	#10	Importing From a CSV	Correct data is loaded from CSV	Pass	2	
13	#10	Importing From a CSV	Pressing import button without CSV	Pass	2	Throws exeption, handle it or disable button until input provided
14	#10	Importing From a CSV	Importing empty CSV	Pass	2	Does not break, but indicate to user that selected CSV file is empty
15	#10	Importing From a CSV	Selecting a new CSV after already selecting one	Pass	2	
16	#79	Creating Data Points For 3D Graph	View Data Points in 3D Space	Pass	2	

17	#79	Creating Data Points For 3D Graph	View Data Points in 3D Space while walking	Pass	2	
18	#79	Creating Data Points For 3D Graph	Interact with Data Points in 3D Space	Pass	2	
19	#79	Creating Data Points For 3D Graph	Touch a Data Point in 3D Space with left controller	Pass	2	
20	#79	Creating Data Points For 3D Graph	Touch with Data Points in 3D Space with right controller	Pass	2	
21	#79	Creating Data Points For 3D Graph	Choose Data Point in 3D Space with left controller	Pass	2	no data point's information is shown yet as we haven't use CSV data to draw those points
22	#79	Creating Data Points For 3D Graph	Choose Data Point in 3D Space with right controller	Pass	2	no data points's information is shown yet as we haven't use CSV data to draw those points
23	#78	Create Axis for 3D graph	View the Axises in 3D Space	Pass	2	
24	#78	Create Axis for 3D graph	Axises visibility when moving along x-axis	Pass	2	
25	#78	Create Axis for 3D graph	Axises visibility when moving along y-axis	Pass	2	
26	#78	Create Axis for 3D graph	Axises visibility when moving along z-axis	Pass	2	
27	#78	Create Axis for 3D graph	Checking the stability of the 3D axes, no lag	Pass	2	
28	#78	Create Axis for 3D graph	Scaling the 3D axes based on loaded data points	Pass		No data points to render and have no method on the user side to check the scaling
29	#26	UI	Details show	Pass	3	

		Interaction for Point Details	when a data point is clicked			
30	#26	UI Interaction for Point Details	Details show for second clicked data point and previous point details disappear	Pass	3	
31	#26	UI Interaction for Point Details	Details of a data point disappear when clicking off a data point	Pass	3	
32	#26	UI Interaction for Point Details	Details of data point stay where they are when user moves around	Pass	3	
33	-- No Issue	App Builds	Verify that the app builds without failure	Pass	3	
34	-- No Issue	Original Spike Removed		Pass	3	
35	#13	Integrate showing the data in 3D	Multiple Access Data is visible	Pass	3	
36	#13	Integrate showing the data in 3D	No data to be show	Pass	3	
37	#13	Integrate showing the data in 3D	Loading data for floats	Pass	3	
38	#120	Data processing backend of the PCA analysis	Passing the right amount of data to be processed	Pass	3	
39	#120	Data processing backend of the PCA analysis	Handling incorrect amount of data passed in for PCA analysis	Pass	3	

Thursday March 14

For thursday, the only change that is made is that we added another test case that is currently failing, importing 500, 000 data points from csv.

Test ID	IssueID	FeatureName	Intent	Pass / Fail	Iderati on #	Notes
1	#61	WebXR spike	Loading WebXR through Quest Browser	Pass	1	
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3	#61	WebXR spike	Meta Quest Controls interact with spike	Pass	2	ID1, Found some Converns with controlls notr releasing as Expected
4	#61	WebXR spike	Spike Responsitivity	Pass	1	
5	#61	WebXR spike	Quest Can Enter VR Mode	Pass	1	
6	#100	FixedJest		N/A	2	
7	#100	FixedJest		N/A	2	
8	#100	FixedJest		N/A	2	
9	#10	Importing From a CSV	CSV buttons become visible to the user	Pass	2	
10	#10	Importing From a CSV	Loading CSV from URL	Pass	2	
11	#10	Importing From a CSV	Loading CSV from local files system	Pass	2	
12	#10	Importing From a CSV	Correct data is loaded from CSV	Pass	2	
13	#10	Importing From a CSV	Pressing import button without CSV	Pass	2	Throws exeption, handle it or disable button until input provided
14	#10	Importing From a CSV	Importing empty CSV	Pass	2	Does not break, but indicate to user that selected CSV file is empty
15	#10	Importing From a CSV	Selecting a new CSV after already selecting one	Pass	2	

16	#79	Creating Data Points For 3D Graph	View Data Points in 3D Space	Pass	2	
17	#79	Creating Data Points For 3D Graph	View Data Points in 3D Space while walking	Pass	2	
18	#79	Creating Data Points For 3D Graph	Interact with Data Points in 3D Space	Pass	2	
19	#79	Creating Data Points For 3D Graph	Touch a Data Point in 3D Space with left controller	Pass	2	
20	#79	Creating Data Points For 3D Graph	Touch with Data Points in 3D Space with right controller	Pass	2	
21	#79	Creating Data Points For 3D Graph	Choose Data Point in 3D Space with left controller	Pass	2	no data point's information is shown yet as we haven't use CSV data to draw those points
22	#79	Creating Data Points For 3D Graph	Choose Data Point in 3D Space with right controller	Pass	2	no data points's information is shown yet as we haven't use CSV data to draw those points
23	#78	Create Axis for 3D graph	View the Axises in 3D Space	Pass	2	
24	#78	Create Axis for 3D graph	Axises visibility when moving along x-axis	Pass	2	
25	#78	Create Axis for 3D graph	Axises visibility when moving along y-axis	Pass	2	
26	#78	Create Axis for 3D graph	Axises visibility when moving along z-axis	Pass	2	
27	#78	Create Axis for 3D graph	Checking the stability of the 3D axes, no lag	Pass	2	
28	#78	Create Axis	Scaling the 3D	Pass		No data points to render and have

		for 3D graph	axes based on loaded data points			no method on the user side to check the scaling
29	#26	UI Interaction for Point Details	Details show when a data point is clicked	Pass	3	
30	#26	UI Interaction for Point Details	Details show for second clicked data point and previous point details disappear	Pass	3	
31	#26	UI Interaction for Point Details	Details of a data point disappear when clicking off a data point	Pass	3	
32	#26	UI Interaction for Point Details	Details of data point stay where they are when user moves around	Pass	3	
33	-- No Issue	App Builds	Verify that the app builds without failure	Pass	3	
34	-- No Issue	Original Spike Removed		Pass	3	
35	#13	Integrate showing the data in 3D	Multiple Access Data is visible	Pass	3	
36	#13	Integrate showing the data in 3D	No data to be show	Pass	3	
37	#13	Integrate showing the data in 3D	Loading data for floats	Pass	3	
38	#120	Data processing backend of the PCA analysis	Passing the right amount of data to be processed	Pass	3	
39	#120	Data processing backend of	Handling incorrect amount of data passed in	Pass	3	

		the PCA analysis	for PCA analysis			
40	#10	Importing From a CSV	Importing 500, 000 data points	Fail	4	This is a new test case that was missed. We will need to use some type of streaming to get all data points into the indexedDB

Saturday March16

Test ID	IssueID	FeatureName	Intent	Pass / Fail	Iderati on #	Notes
1	#61	WebXR spike	Loading WebXR through Quest Browser	Pass	1	
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3	#61	WebXR spike	Meta Quest Controls interact with spike	Pass	2	ID1, Found some Converns with controlls notr releasing as Expected
4	#61	WebXR spike	Spike Responsitivity	Pass	1	
5	#61	WebXR spike	Quest Can Enter VR Mode	Pass	1	
6	#100	FixedJest		N/A	2	
7	#100	FixedJest		N/A	2	
8	#100	FixedJest		N/A	2	
9	#10	Importing From a CSV	CSV buttons become visible to the user	Pass	2	
10	#10	Importing From a CSV	Loading CSV from URL	Pass	2	
11	#10	Importing From a CSV	Loading CSV from local files system	Pass	2	
12	#10	Importing From a CSV	Correct data is loaded from CSV	Pass	2	
13	#10	Importing From a CSV	Pressing import button without CSV	Pass	2	Throws exeption, handle it or disable button until input provided
14	#10	Importing From a CSV	Importing empty CSV	Pass	2	Does not break, but indicate to user that selected CSV file is empty

15	#10	Importing From a CSV	Selecting a new CSV after already selecting one	Pass	2	
16	#79	Creating Data Points For 3D Graph	View Data Points in 3D Space	Pass	2	
17	#79	Creating Data Points For 3D Graph	View Data Points in 3D Space while walking	Pass	2	
18	#79	Creating Data Points For 3D Graph	Interact with Data Points in 3D Space	Pass	2	
19	#79	Creating Data Points For 3D Graph	Touch a Data Point in 3D Space with left controller	Pass	2	
20	#79	Creating Data Points For 3D Graph	Touch with Data Points in 3D Space with right controller	Pass	2	
21	#79	Creating Data Points For 3D Graph	Choose Data Point in 3D Space with left controller	Pass	2	no data point's information is shown yet as we haven't use CSV data to draw those points
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23	#78	Create Axis for 3D graph	View the Axises in 3D Space	Pass	2	
24	#78	Create Axis for 3D graph	Axises visibility when moving along x-axis	Pass	2	
25	#78	Create Axis for 3D graph	Axises visibility when moving along y-axis	Pass	2	
26	#78	Create Axis for 3D graph	Axises visibility when moving along z-axis	Pass	2	
27	#78	Create Axis	Checking the	Pass	2	

		for 3D graph	stability of the 3D axes, no lag			
28	#78	Create Axis for 3D graph	Scaling the 3D axes based on loaded data points	Pass		No data points to render and have no method on the user side to check the scaling
29	#26	UI Interaction for Point Details	Details show when a data point is clicked	Pass	3	
30	#26	UI Interaction for Point Details	Details show for second clicked data point and previous point details disappear	Pass	3	
31	#26	UI Interaction for Point Details	Details of a data point disappear when clicking off a data point	Pass	3	
32	#26	UI Interaction for Point Details	Details of data point stay where they are when user moves around	Pass	3	
33	-- No Issue	App Builds	Verify that the app builds without failure	Pass	3	
34	-- No Issue	Original Spike Removed		Pass	3	
35	#13	Integrate showing the data in 3D	Multiple Access Data is visible	Pass	3	
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Problems Observed While Testing

1. Billboard for data points is flashing still
2. After selecting the first data point, the second is hard to find as controller crosshairs match the billboard colour.
3. If in testing mode, we need a way to display all data for better user testing.
4. No current easy way to get csv onto meta quest, matthew suggested the following
    - Integrating google drive with our react app
    - Adding a driver? I don't know how that would work with Mac

Reviewing current test coverage

File	% Stmts	% Branch	% Funcs	% Lines	Uncovered Line #s	
All files	81.56	42.85	75.6	80.81		
components	75.26	36.2	60	75		
CreateTicks.tsx	100	100	100	100		
DataPoint.tsx	55.55	33.33	20	55.55	18-29, 34-43	
GenerateXYZ.tsx	100	100	100	100		
Positions.tsx	100	71.42	100	100	45	
SingleAxis.tsx	65.9	21.62	100	65.11	43-58	

contexts	86.66	0	75	85.71		
PointSelectionContext.tsx	86.66	0	75	85.71	50, 74	
repository	97.91	87.5	100	97.87		
Column.tsx	100	100	100	100		
DataPoint.tsx	100	100	100	100		
DbRepository.tsx	97.05	87.5	100	96.96	17	
utils	78.78	50	73.68	77.17		
Assert.tsx	100	100	100	100		
CsvUtils.tsx	55.55	0	44.44	52.38	65-82, 110-121	
PcaCovariance.tsx	100	100	100	100		
StandardizeDataset.tsx	92.85	66.66	100	91.66	23	

Overall we have just around 80% total test coverage, which is fairly good coverage but it would be very easy to increase this. This report exposed some of the remaining areas that we can go and specifically improve on, increasing the overall reliability and trust that we can place in each function.

ID5 Investment into testing

Due to the nature of our testing, if we want to have some form of automated testing in any area of code, we are going to have to change the source code to include special testing cases that allow us to have someone do human in the loop testing. This is going to require a large investment into testing, as when developing we are going to have to communicate, so that the proper hooks can be placed into the code allowing us to access the data we need to test. This is a unique way of testing, but with the nature of the application will allow us to expose almost any detail that we want, giving a unique way of testing.