

Workshop 5 Report

Workshop/Share-out 5, October 1st, 2021.

1.0 Workshop setup:

This workshop took place over zoom. Participants were a mixture of [dance undergraduates, postgraduates, teaching staff and engineering undergraduates]. Due to the restraints of lockdown, this workshop was an altered version of the live interactive workshop the researchers wanted to conduct.

Participants were shown six scenes that Hazel and Rae had created in Unity and filmed in VR. The scenes showed a virtual environment reacting in accordance with prerecorded dance animation data. The dance data had been sourced using an axis neuron motion capture suit in an earlier workshop. Participants were shown a live video of the real life dance alongside the Unity scenes for comparison.

Finally, participants were shown a recording in which the VR user was given control over the parameters for the particle scene through an in-game control panel.

2.0 Event Structure:

Participants were first shown a series of 6 scenes alongside footage of the dance in real life and a final additional recording of a user controlling parameters in VR. After each video, participants were invited to fill out their initial thoughts in a google form before opening up to group discussion, so as to avoid bias.

The first scenes shown were two particle representation scenes. In the first, gravity is set low, generating a looser form. In the second, gravity is high, creating a more bunched effect.

The next scene was a scale based scene. In this scene, the velocity of the dancer corresponds to the height of the virtual blocks. Different blocks respond to different parts of the body, for example, a group of blocks is affected only by the right arm, or left arm, etc.

In the 4th scene a noise map was used for procedural terrain. The height of the terrain was determined by the average height of the body. The granularity of the terrain was determined by the acceleration of the body, and the impact of this granularity is affected by velocity. As the user

moves through the terrain, it freezes in place behind them, leaving a trail that reflects their movement.

Then, two sound scenes were demonstrated.

In the first sound scene, an ambient musical track is playing in the background. Similar to the scale scene, as the body moves, different spheres change colour. The floor oscillates at an amplitude that increases with fast movement, and decreases with slow movement. A rushing air sound reflects the overall speed of the dancer.

In the second sound scene, sudden changes in acceleration trigger different sounds to play and spheres to light up. There is one sphere for each hand and foot. These spheres are intermixed with other spheres that glow according to average velocity of the movement. When movement over the past 20 seconds is increasing in activity, a more mid-heavy track is favoured, and when it is decreasing, a more bassy, slow track is favoured.

The final video shown to participants was of a user in VR controlling the parameters behind the particle representation scenes via an in-game control panel. The parameters available for adjusting were as follows: minimum emission, velocity-emission multiplier, particle start speed, gravity, inherit velocity multiplier, particle lifetime, enabling collision, colour, and enabling or disabling different areas of the body. Participants could see the effects of these changes on the particle representation as they were made.

3.0 Results

3.1 Particle Representation Scenes

3.1.1 First Particle Scene

From survey:

- One participant noted that the scene hinted at the dancer's movement without giving any real indication of where the dancer's body was, and they thought that was visually cool.
- Discussions around energy, lots of those.
- Participants were able to put a name to the variable of gravity, commenting that they liked that the rule of gravity still applied and another commenting that it was interesting to explore the impact of gravity on a tessellated body.

From discussion:

- Was discussion around the importance of velocity and particle lifetime as parameters.
- Successful picking up on abstract -> solid

Summary:

At this stage participants were still getting comfortable and figuring out what the share out was going to be. Participants were able to determine that there were some parameters that changed throughout the scene, and began to put their own names to them. Most were able to identify gravity, a parameter that mirrors real life. One participant described a parameter of energy. A participant who had a more technical background discussed how important they think particle lifetime and velocity parameters are to changing the behavior of the particles.

3.1.2 Gravity Particle Scene

From survey:

- Participant noted it was easier to understand where their body was in comparison to the previous scene.
- Participant thought it would be cool to see the particles duplicated, maybe with slight modification, so it seems like there were multiple sets of people.
- Compared to trails of wind, systems of action and reaction. Linked in the concept of detritus and energy coming to rest.
- Participant noted potential for the programme as a device to stimulate and challenge movers with a responsive practice. Talks about “Participants with a keen sense of curiosity for discovering the triggers/ rules of the movement 'game'”
- Participant curious about the potential for interacting with previously emitted particles, theme of having an impact on the environment over time.
- Dancer noted how the particles primarily moved through the vertical plane and liked that their body naturally finds itself moving in these different patterns.
- “Movement anchoring from the core and spiralling outwards in response”

From discussion:

- Mark discussed the psychological concept of mapping human forms onto representations when they were less.
- Alex noted how the columns of particles falling made it look as though there were multiple people dancing together.
- Potential application: Choreography or teaching tool perspective: be of benefit to dancers who are trying to figure out action forms
- Because of the gravity it feels grounded, heavier.
- Identified the opportunity to explore the concepts of heaviness and lightness.

Summary:

Participants found it easier to distinguish the human form with this scene than the previous scene. They used words like “grounded” and “heavier” to describe the impact the higher gravity parameter had on their experience of the scene.

At this point participants began to discuss ideas for different versions of the scene, potential applications and further explorations they were curious about.

A participant was curious about whether the program could be changed so the dancer could interact with previously emitted particles, suggesting that [they want more impact on the environment around them, they want to be creating more physical tangible things rather than abstract representations of previous movements]

3.2 Scale Change Scene

From survey:

- Participants struggled with finding the correlation between the dancer and the impact on the cubes.
- Yin-chi, the actual dancer, noted her unique experience of being in the scene and the difference between purposely making movement for the scene and watching a playback of disconnected improv dancing.

From discussion:

- The sweeping motion of the dancer did not correlate to the jerky/sporadic movement of the cubes.
- As the cubes were laid out according to a rough layout of the body, by rotating in the VR space the dancer could lose orientation, maybe a way to orient the body could be useful.
- Some participants liked the challenge of trying to figure out what the correlation is, referred to it as a potential movement game, said they found it stimulating.
- Comments around aesthetics, colours and contrast.
- Sarah thinks that there is a lot of information in yin-chi's movement, but then there is other information that was being displayed.
- Relationship between being able to see what i am interacting with and not see what i am interacting with is an extreme influence on my movement decisions - yin-chi

Summary:

This was the first of the scenes with more abstract representations of movement. Participants were mainly focused on how they struggled to find a correlation between the dancer and the impact on the cubes.

3.3 Procedurally Generated Terrain Scene

From survey:

- Similar to previous scene, struggling with the correlation.
- Felt the monotone made it hard to see smaller changes in the visual output.
- Participant noted it would be cool to see this scene expanded to be more realistic terrain with more variables changing due to movement, such as trees rocks etc.
- Overall difficult to connect, disorienting but intriguing. Interest was shown in trying it out in VR and pushing boundaries.

From discussion:

- Mark thinks this would be a really cool piece to explore in vr. Would be a really cool performance piece, notes the involvement of an audience (without us prompting that).
- More focus on it being used as a performance piece and the look of it.

3.4 Sound Scenes

3.4.1 Ambient Sound

From survey:

- Found it satisfying to have movement trigger sound. Found it clear to view relationships between movement and sound, but extra details in the scene such as the size of the spheres made them curious when those relationships were non existent. Potentially distracting.
- Overall a very positive response to the inclusion of music.

From discussion:

- Spheres were blending into the background (this was intentional on the developer's side, but confused people as to what the point of focus in the scene was)
- Yin-chi - from perspective of dancer, seeing this space is really exciting. There is sound and colours. Looking at my movements behind it im really disappointed that was the movements i choose. I would have loved to explore this and choose my movement.
- Comments about how it was satisfying for movements of strength to have a strong sound.
- Felt sound added another dimension to movement qualities.

3.4.2 Wave Sound

From survey:

- Intrigued by different qualities and textures of sound.
- Discussions of dancer's rhythm.

From discussion:

- Lucie - there is sounds and animation at the same time, and the first thing that comes through is sound
- Yin-chi - didnt notice the sound had a connection, third time noticed the calm rhythm, felt the rhythm was boring and realised they were creating that rhythm and **made her want to change her dance because of the generated rhythm.**

3.5 Particle Control Scene

From survey:

- Excitement around potential applications and opportunities for this program. Lots of examples of applications.

From discussion:

- Naming conventions, “There is a question around the use of terminology, because currently it comes from the technical perspective”
- Thought it was interesting to give controls over to someone who isn’t necessarily the dancer.

3.6 Overall Impressions

From survey:

- Participants felt most compelled by the sound and the particles scenes.
- They enjoyed being able to understand the correlation between the mover and the visual/audio feedback.
- They found it compelling how these spaces might inform the dancers movements and motivate different choices. They liked how it encouraged exploration.
- They liked when there were more obvious links as they felt it made it more related, rather than something separate that just happened to be occurring simultaneously. However they also noted that the less obvious links stimulated urges to figure out what the link was.
- They commented that the obvious links were “ASMR-ish” and encouraged their body to follow, create and reimagine the movements. This resulted in a kinesthetic experience for them while watching.
- They were all interested in using the scenes as generative tools.

From discussion:

- Body awareness and self judgement can be a major factor/inhibitor to dancers, so the opportunity to move away from a direct representation is welcomed.
- Could be used as a choreographic tool as dancers explore how movement can start and develop.
- A strong sense of play, playfulness and exploration.
- More thought/experimentation could go into how each scene could be adapted for audience, choreographer, or dancer’s perspectives. Everyone was viewing the videos through different lenses.
- They thought it was compelling to think about how with so many aspects to movement, which ones do you capture as parameters.
- People were hesitant to name specific parameters because of the terminology being difficult to remember, though pre being told names they had been naming them by themselves.

Summary notes:

Participants discussed how there are so many aspects to movement and choosing which ones to capture as parameters was compelling to think about. Due to lockdown restraints those aspects were mainly chosen from a technical feasibility point of view as no direct consultation could be done with dancers in VR, however these comments suggest that more thought needs to be put into this decision. A possible avenue for future work would be to identify which aspects of movement are most compelling for VR representation, rather than the reverse that we have been investigating.

4.0 Conclusions

Our aim is to iteratively develop compelling and responsive VR that elicits embodied dance movement.

Through a series of workshops, we asked: “What are people’s experiences of various types of VR feedback relative to physical movement, in the context of dance? What are perspectives as dancers, choreographers, and audience members?”

At each stage, we interview participants to understand aspects of their experiences and draw design implications which then feed into prototypes/experiences brought to subsequent workshops.

In our final share-out, participants experienced particles with different qualities, different types of responsive structures (blocks and terrains) being either still or moving through it, and different types of multi-modal (audio-visual) pairings.

We then focused on feedback on the dashboard as we wanted to support feelings of control as well as empowering the artist to set their own parameters to craft their own vision. We found that participants have X experiences related to X types of responsive VR feedback.