Animation Project Report

Introduction:

My animation story is about a human go through a dangerous maze with a lot of viruses and finally get it! The idea is from the New coronavirus outbreak in 2020, and I want to encourage myself in the lock down time in Ireland.

Requirement:

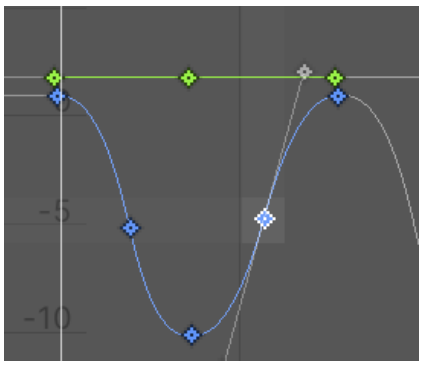
The required components are:

- **Must have** 3-dimensional objects and views
- **Must be** 30 seconds or longer
- **Must have** a non-linear animated camera path
- **Must have** one reasonably realistically moving articulated animated character, as part of the story-line and visible during the camera path
    a. There must be multiple joints and children (e.g., arm links and fingers)
    b. The articulated character will be assessed to ensure it has a correct hierarchy and can move correctly according to its structure.
    c. It can use forward or inverse kinematics
    d. It does not have to be organic/human (i.e., can be a robot or object come to life)
- **Must have** an interactive element (e.g., character reacts to user throwing a ball, etc.)
- **Must clearly demonstrate** the following principles of animation in the context of the movie. Note: There should be 5 separate examples visible, and they should be part of the story-line and visible during the camera path.
    a. Squash and Stretch
    b. Ease in, Ease out
    c. Arcs
    d. Anticipation
    e. Exaggeration

The scene has two cameras to control, one is for moving different points in the space with smooth speed, the other one is a camera always following the animator.

The model is a 3D model from asset store with grand hierarchy and IK system.

The virus has different actions in my scene:
Doing Squash and Stretch with virus size change
Doing Ease in and Ease out with virus curves (see figure below)
Doing Arcs with virus route(more than 2 points)
Doing Anticipation with a smaller, then much bigger virus



There are two interactions in my scene, the first one is the virus will move away when animator hits it. The second one is the automatic elevator is going up or down when animator enters and leaves.

Additional Features:

1. Motion Capture
2. Motion State Machines
3. Motion Editing – blending, transplanting, etc.
4. Facial animation using morph targets
5. Automatic lip-sync from text or audio
6. Stylized motion
7. Crowd Simulation
8. Gesture or personality modelling for the character
9. Complex/scripted camera motion
10. Interesting character behaviours/AI
11. Particularly imaginative narrative
12. Cloth Simulation
13. Advanced Particle systems
14. Physically-based animation

2. Do the state Machine in my automatic elevator

6. Control over the animator, virus and other objects action through scripts.

9. Have two scripts for controlling two cameras.

13. Add a simple particle system to a virus

8,11. The animator is a brave human being, facing the dangerous maze and virus, finally get the medicine tablet and beat virus.

```
private void OnTriggerEnter(Collider other)
{
    //animation state
    AnimationState state = ani["up"];
    state.time = 0;
    state.speed = 1;
    ani.Play("up");
}

private void OnTriggerExit(Collider other)
{
    //animation state
    AnimationState state = ani["up"];
    state.time = state.length;
    state.speed = -1;//reverse play
    ani.Play("up");
}
```

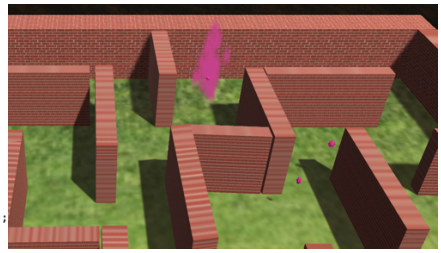
```
public class Inter : MonoBehaviour
{
    private Animation ani;
    // Start is called before the first frame update
    void Start()
    {
        ani = GetComponent<Animation>();
    }

    private void OnTriggerEnter(Collider other)
    {
        ani.Play("Interactive");
    }
}
```

```
void Update()
{
    if (Input.GetKeyDown(KeyCode.Alpha1))
    {
        currentView = views[0];
    }
    if (Input.GetKeyDown(KeyCode.Alpha2))
    {
        currentView = views[1];
    }
    if (Input.GetKeyDown(KeyCode.Alpha3))
    {
        currentView = views[2];
    }
}

void LateUpdate()
{
    transform.position = Vector3.Lerp(transform.position,currentView.position,Time.deltaTime*speed);

    Vector3 currentAngle = new Vector3(
    Mathf.LerpAngle(transform.rotation.eulerAngles.x, currentView.transform.rotation.eulerAngles.x, Time.deltaTime * speed),
    Mathf.LerpAngle(transform.rotation.eulerAngles.y, currentView.transform.rotation.eulerAngles.y, Time.deltaTime * speed),
    Mathf.LerpAngle(transform.rotation.eulerAngles.z, currentView.transform.rotation.eulerAngles.z, Time.deltaTime * speed));
    transform.eulerAngles = currentAngle;
}
```



Reference:

Basic scene: https://www.youtube.com/watch?v=U0dlWhB_e0E
Automatic elevator function:
https://www.bilibili.com/video/BV1BW41187fL?from=search&seid=2385478750460622926
Virus and tablet models are from: https://www.turbosquid.com/

My animation YouTube video link:

https://www.youtube.com/watch?v=PUs0npLygKc