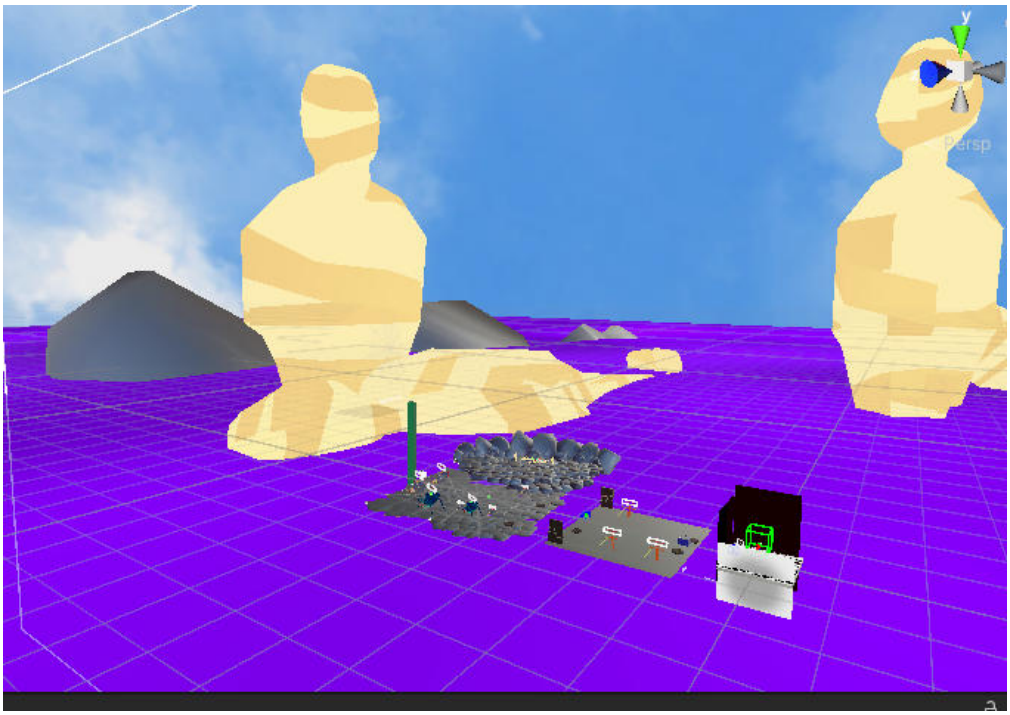
salar.rezayani@gmail.com

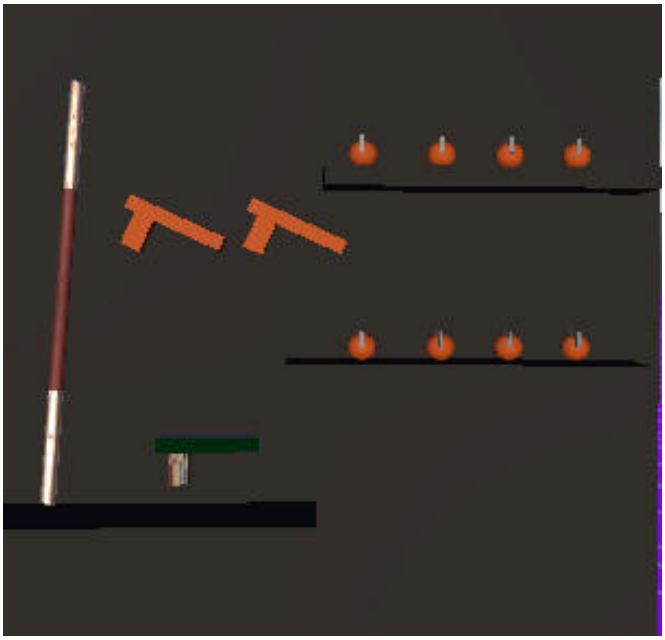
VR game

Save the planet from aliens!

Story: ailiens are has sent giant spiders to get our planet. Spiders mummified most of humans. after killing the guards and their spiders, at the final stage, aliens will attack by their cubic space ships. Save our planet from ailians!



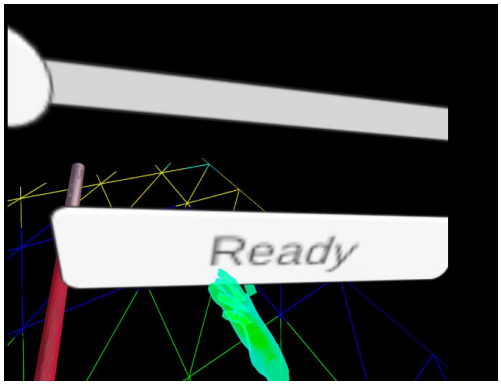
Weapons: Wood, Gun, Granade(instant kill)



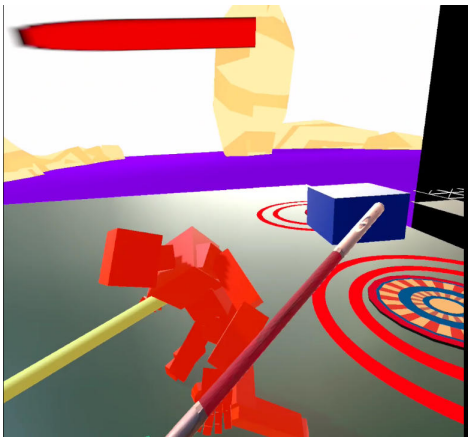
Defence: Defence drawer ball

salar.rezayani@gmail.com

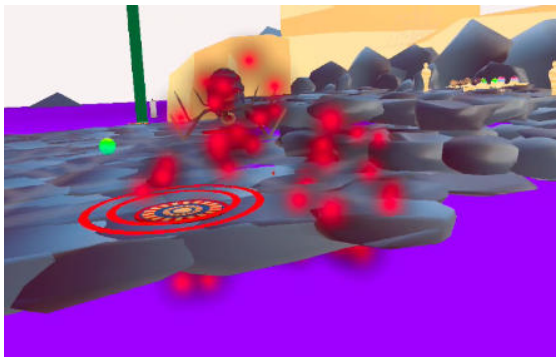
Game start UI button



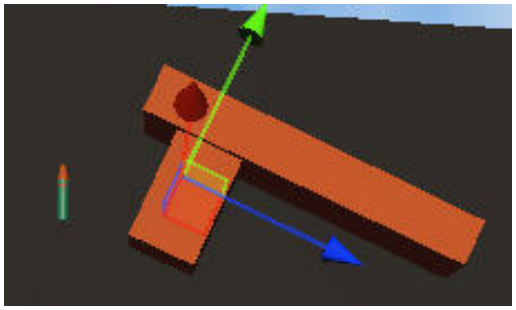
attack with wood colosion detection



Granade and explosion effect



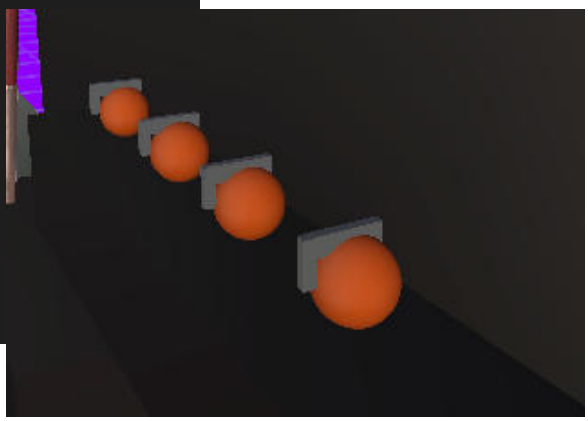
Gun and bullet:



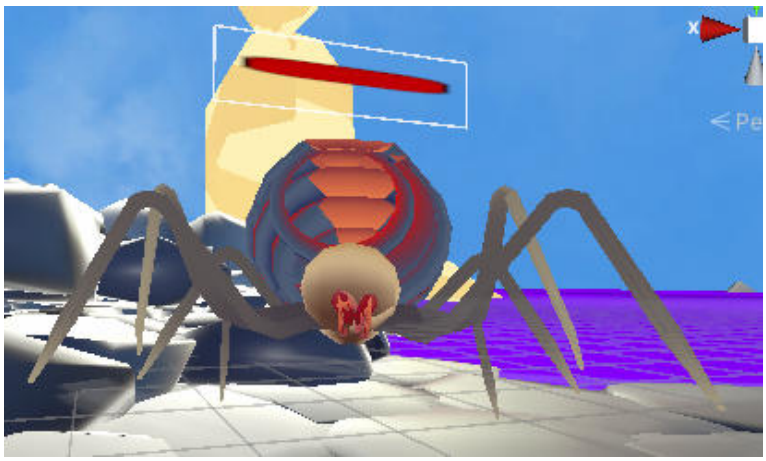
Granades code: find all nearby objects. if human ->kill, if rigid body -> explode with forse.

```
public void Expload()
{

    Instantiate(explosionEffect, transform.position, transform.rotation);
    Collider[] colliders=  Physics.OverlapSphere(transform.position,radius);

    foreach (Collider nearbyObject in colliders)
    {
        Rigidbody rb = nearbyObject.GetComponent<Rigidbody>();

        life2Benem dier = nearbyObject.GetComponent<life2Benem>();
        if (dier != null)
        {
            dier.die();
        }
        lifeSpider dierr = nearbyObject.GetComponent<lifeSpider>();
        if (dierr != null)...
        Exploding des = nearbyObject.GetComponent<Exploding>();
        if (des != null)...
    }
    Collider[] collidersmove = Physics.OverlapSphere(transform.position, radius);

    foreach (Collider nearbyObject in collidersmove)
    {
        Rigidbody rb = nearbyObject.GetComponent<Rigidbody>();
        if (rb != null)
        {
            rb.AddExplosionForce(force, transform.position, radius);
        }

    }
    Destroy(gameObject);
}
```

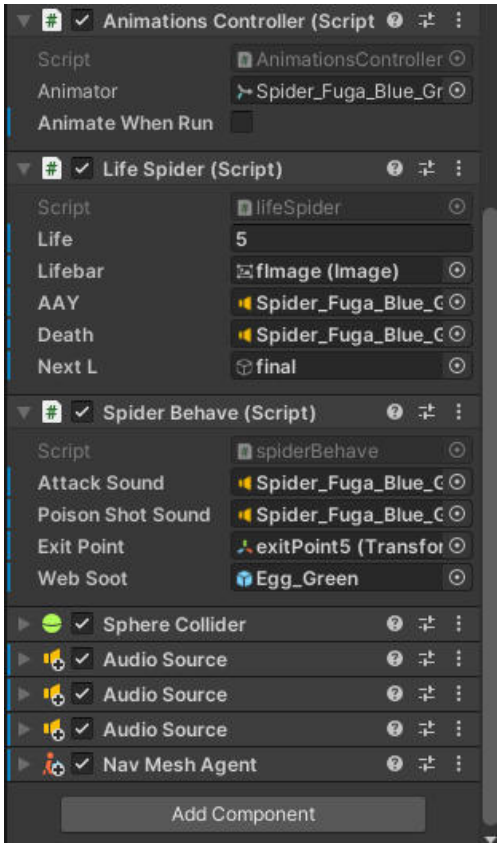
```
    if(countdown<= 0f && !hasExploded)
    {
        audioexplode.Play();
        Expload();
        hasExploded = true;
    }
}

public void triggerIt()
{
    i = 2;
    countdown = delay;
}
```



Spiders: - Instantiates one after another.
- Follow player + at proper distance start long or short rang attack.
- Attacks: Long rang: poison shot. Short range: bite.



spider behavior



Spider behavier:

```
if (enemyObject != null)
{
    enemyTransform = enemyObject.transform;
    agent.transform.LookAt(enemyTransform.position);
    anim.SetBool("IsMoving", (((agent.velocity.magnitude / agent.speed) > 0.01) && agent.remainingDistance > 0.
    float dist = (enemyTransform.position - agent.transform.position).magnitude;
    if (enemyObject != null && attacking == true)
    {
        anim.SetBool("Attack", true);
        if (dist < 15  && dt > 1)
        {
            if (dist < 4 )...
            else
            {dt = 0;shootweb();}
        }}
    else
    {   anim.SetBool("Attack", false);}

    Vector3 between = agent.transform.position - enemyTransform.position;
    attacking = true;
    if ((between.magnitude) > 3)
    {   agent.destination = between.normalized * 3f + enemyTransform.position;}}
else
{   anim.SetBool("Attack", false);
    agent.destination = agent.transform.position;
}}
public void shootweb()
{
    GameObject tempBullet;
    tempBullet = Instantiate(webSoot, exitPoint.position, exitPoint.rotation) as GameObject;
    tempBullet.tag = "enemy";
    tempBullet.GetComponent<Rigidbody>().velocity = transform.forward * 10;
    poisonShotSound.Play();
    Destroy(tempBullet, 2.0f);
}
```

choosing attack by distance

shoot web from mouth

shoot web from spider mouths

salar.rezayani@gmail.com

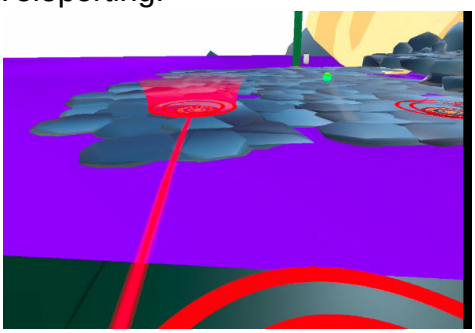
Player Damage is Dynamic Damage: (call of duty damage with refilling life after rest)

```
void Update()
{
    dthit += Time.deltaTime;
    dt += Time.deltaTime;
    if (dthit > 3 && life>0)
    {
        if (life == 1) { life = 0; } else { life -= 2;}
    }
    alpha = (life / totallife);
    img.color = new Color(rawColor.r, rawColor.g, rawColor.b, alpha);
}
public void hit()
{
    if (dt > .5)
    {
        life = life + 1;
        dt = 0;
    }
    dthit = 0;
}
```

- Hit getter: XR rig can not accept collider for hit (it was a big challeng) :

```
void Update()
{
    dist = Mathf.Abs(transform.position.x - player.transform.position.x) + Mathf.Abs(transform.position.z -
    //Debug.Log(dist);
    if (dist < 0.3) {
        Debug.Log("hitteted");
        player.SendMessage("hit");
    }
}
```

Teleporting:

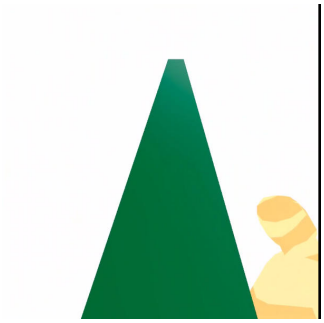


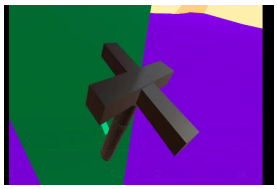
salar.rezayani@gmail.com

Final stage:

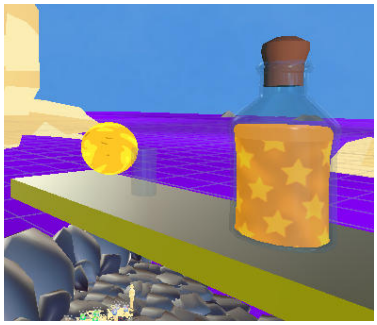
Flying: (was a challenge)(XR has problem with rigid body o character ontroller)
Made XR rig child of a imaginary surface far away, with rigid body.

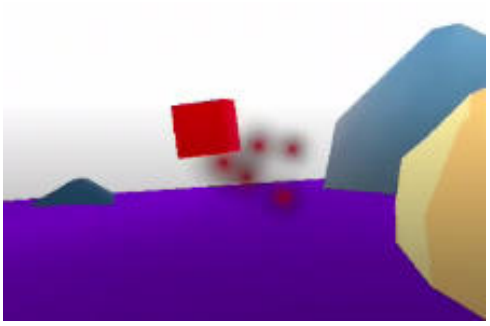
```
    {
        rb = playerController.GetComponent<Rigidbody>();
    }

    public void FlyingCheck(float gripAmount)
    {
        if (gripAmount > 0.1f)
        {
            rb.velocity = transform.up * 5;
            isFlying = true;
        }
        else if (isFlying)
        {
            StopJet();
            isFlying = false;
        }
    }

    public void DoJet(float buttonForce)
    {        rb.useGravity = false;}

    public void StopJet()
    {        rb.velocity = transform.up * 0;
        rb.useGravity = false;}

    public void jump()
    {        rb.velocity = transform.up * 1f;}
    public void stop()
    {        rb.velocity = transform.up * 0;}
}
```



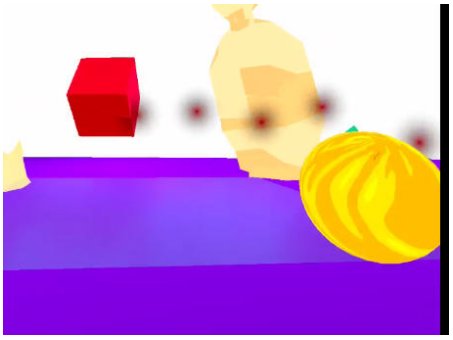


Spaceships: attackers are rotating cube with particles
As player moves the yellow ball (drawer tool), attack will start:

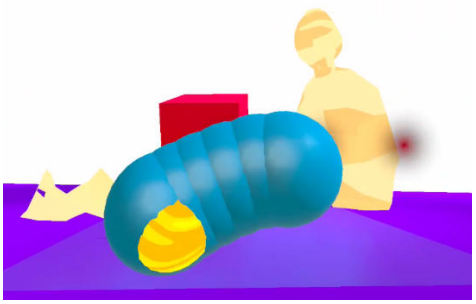




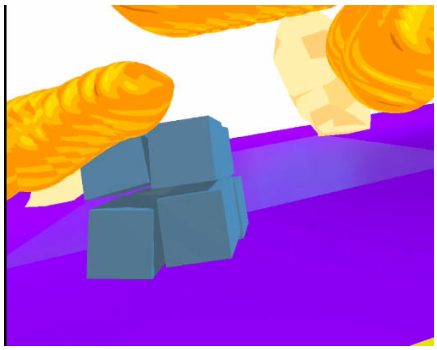
drawing self defece shild:



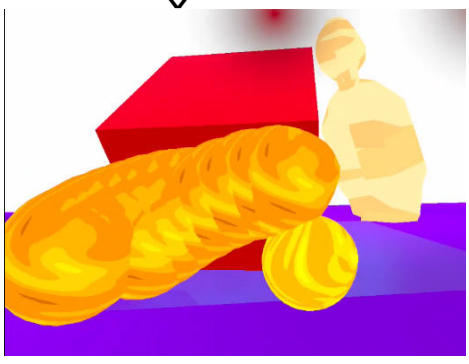
drawing
==>



!! it became rigid for defence



<==
contact = explode



Code of drawing defence:

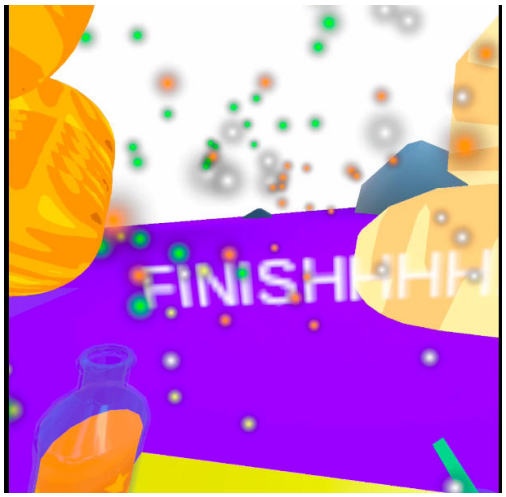
```
void Update()
{
    cntrlrPose = controller.position;
    if (i == 1) {

        if(drawing == false)
        {
            parentt = Instantiate(empty, cntrlrPose, Quaternion.identity) as GameObject;
            firstpose = parentt.transform.position;
            parentt.name = "wood";
            drawing = true;
        }else
        {
             GameObject temp;
             temp = Instantiate(point, cntrlrPose, Quaternion.identity) as GameObject;
             temp.name = "wood";
             temp.transform.parent = parentt.transform;
        }
    }
    if (i==2){
        if (drawing == true)
        {
            MeshFilter[] meshFilters = parentt.GetComponentsInChildren<MeshFilter>();
            CombineInstance[] combine = new CombineInstance[meshFilters.Length];

            int i = 0;
            while (i < meshFilters.Length)
            {
                combine[i].mesh = meshFilters[i].sharedMesh;
                combine[i].transform = meshFilters[i].transform.localToWorldMatrix;
                meshFilters[i].gameObject.SetActive(false);

                i++;
            }
            parentt.transform.GetComponent<MeshFilter>().mesh = new Mesh();
            parentt.transform.GetComponent<MeshFilter>().mesh.CombineMeshes(combine);
            parentt.transform.position = parentt.transform.position - firstpose ;
            parentt.transform.gameObject.SetActive(true);
            parentt.transform.name = "wood";
        }
        drawing = false;
        i = 0;
    }
}

public void startdraw()
{
    i = 1;

}
public void stopdraw()
{
    i = 2;
}
```

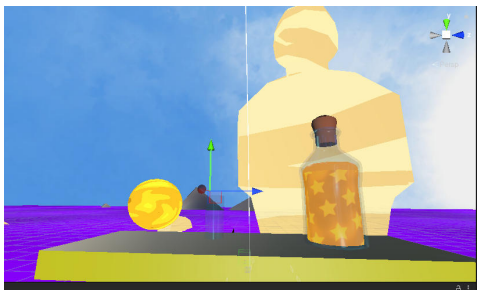
the drawing is done by instantiating a prefab, as child of "parentt", at each update (when right-controler is triggered.)

At the end all meshes combines to gether.

Final step: Let's Party

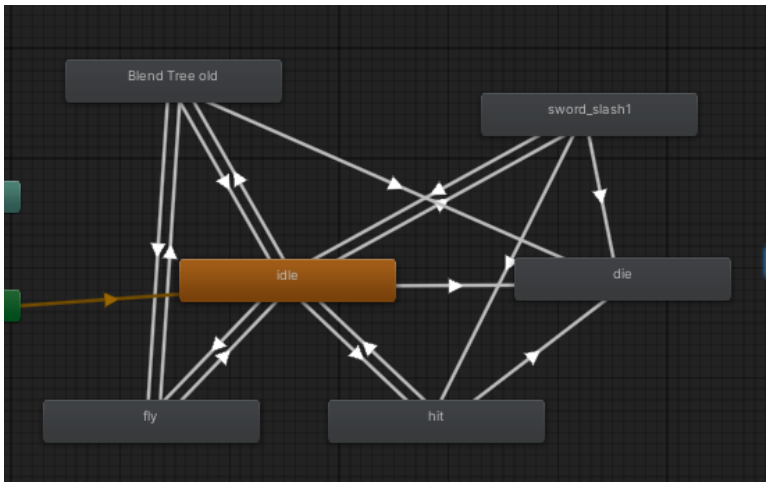
After defitting all ailians spaceships,
Celebrate starts by pooring drink in glass reciver:



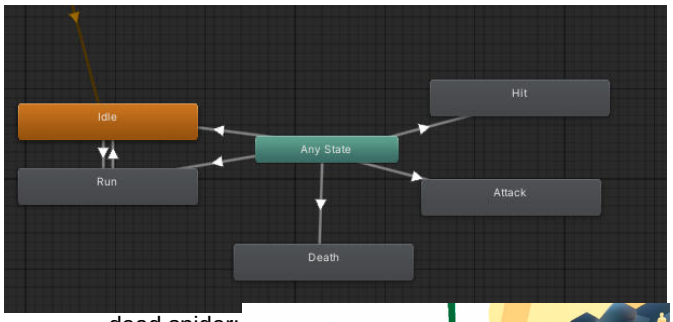


salar.rezayani@gmail.com

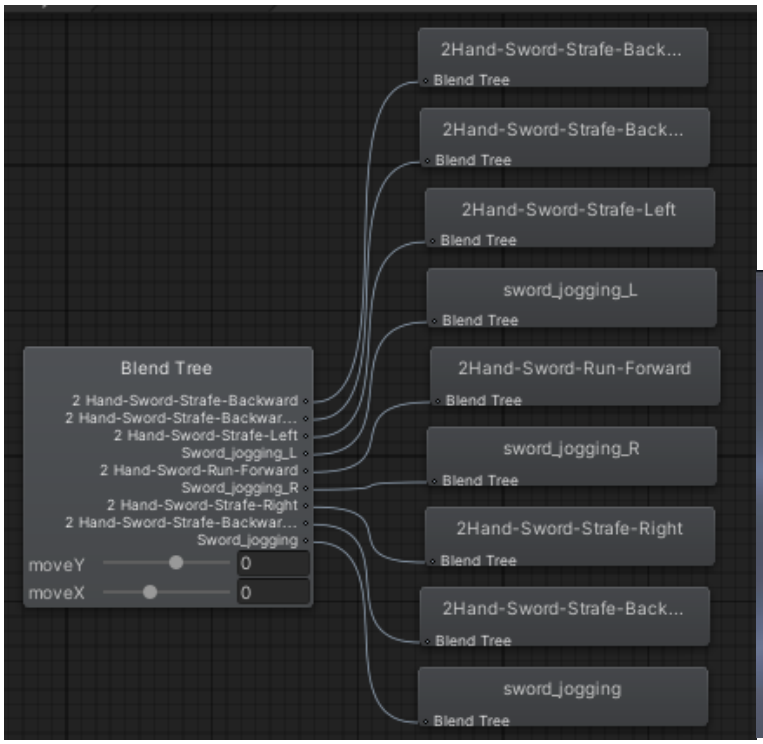
Enemy animations:



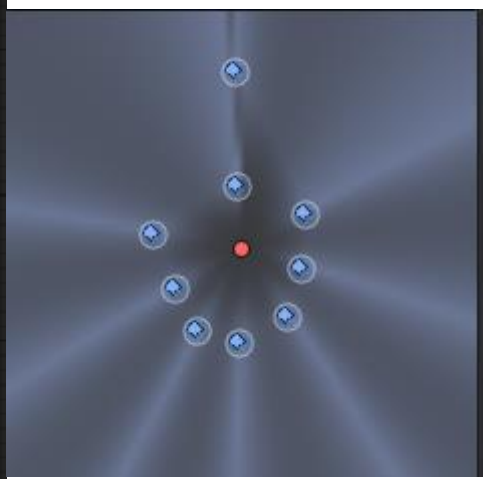
Spider animation:



dead spider:



: enemy blend tree



-

- Enterance: velocity.magnitude > 0.01

- 9 points of blend tree: walk and run and 45 degrees

- The agent's velocity, acceleration, and angular velocity has optimized for best reaction.

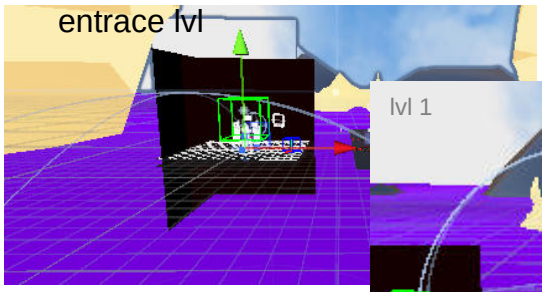
```
//---- movement for blender
if ((agent.velocity.magnitude / agent.speed) > 0.1)
{
    Vector3 normalizedMovement = agent.desiredVelocity.normalized;
    Vector3 forwardVector = Vector3.Project(normalizedMovement, transform.forward);
    Vector3 rightVector = Vector3.Project(normalizedMovement, transform.right);
    float forwardVelocity = forwardVector.magnitude * Vector3.Dot(forwardVector, transform.forward);
    float rightVelocity = rightVector.magnitude * Vector3.Dot(rightVector, transform.right);
    anim.SetFloat("moveX", forwardVelocity);
    anim.SetFloat("moveY", rightVelocity);
}
```

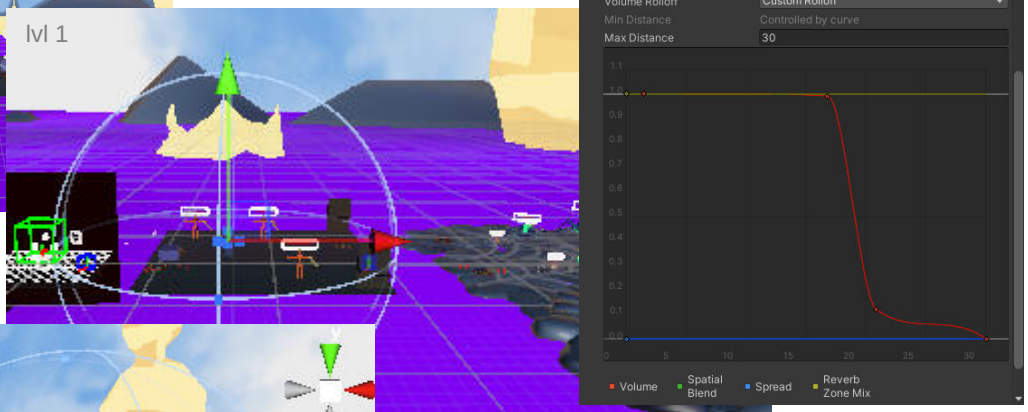
Code Descriptions of blend tree:

- Blend tree gets moveX and moveY which are the project of the desired agent velocity on the current transform of the agent. The desiredVelocity is a nav mesh agent component, based on the destination of agent that clicked by user or the place of player for enemies.

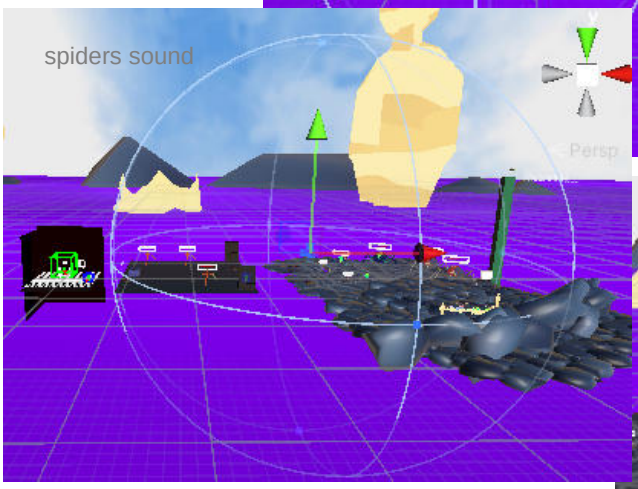
salar.rezayani@gmail.com

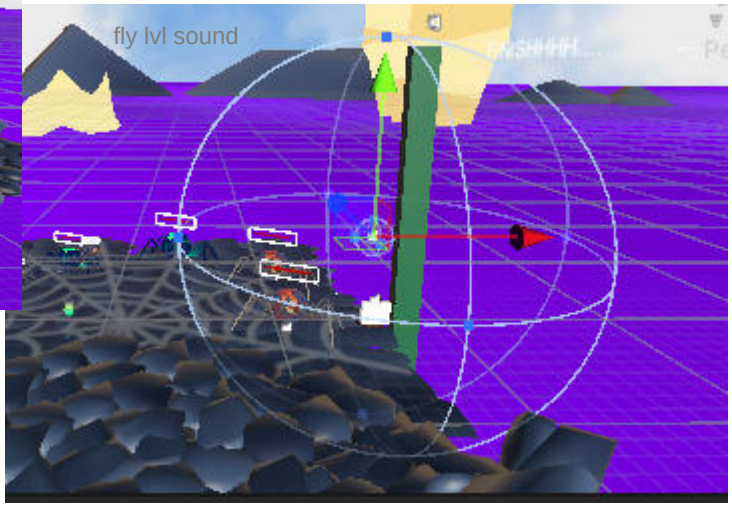
Sound maintenance:



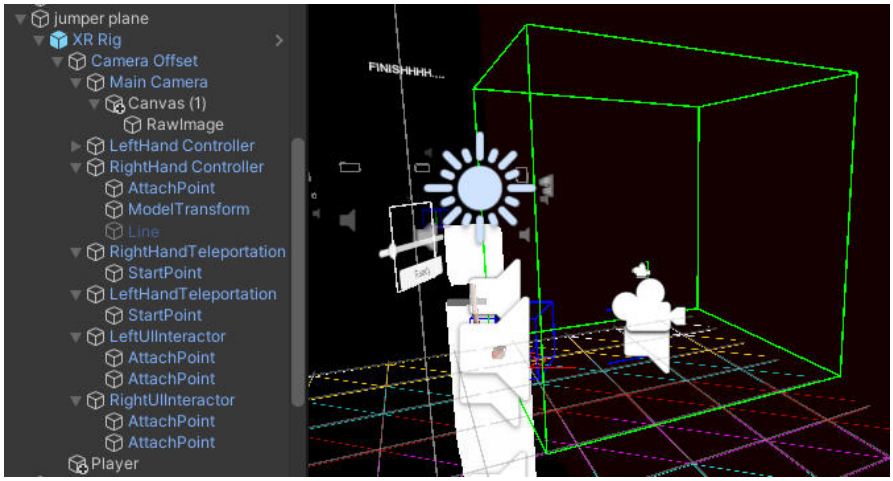


enterance and first lvl musics are self-made





VR & XR rig



Toolkits: XR interaction toolkit, oculus XR plugin, XR plugin management

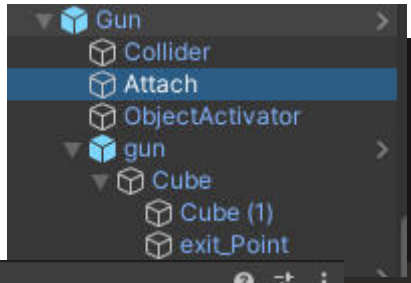
Control system:

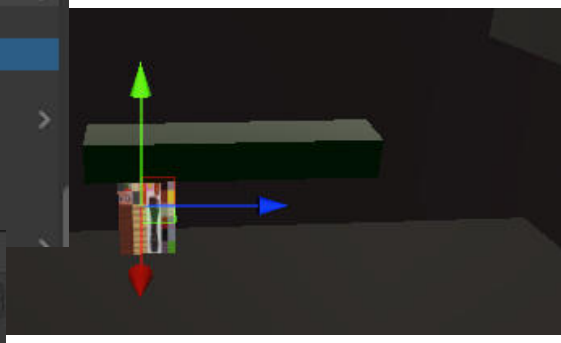
Each object has an attach point and a activator.

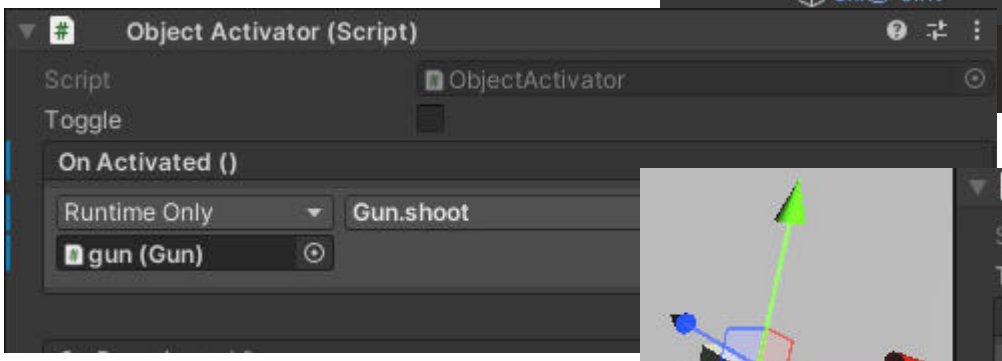
Attach point is where objects attached.

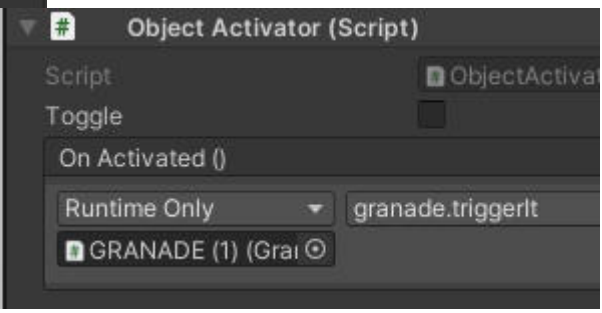
Object activator run given functions of the object.

The collider chech the hand enterance.



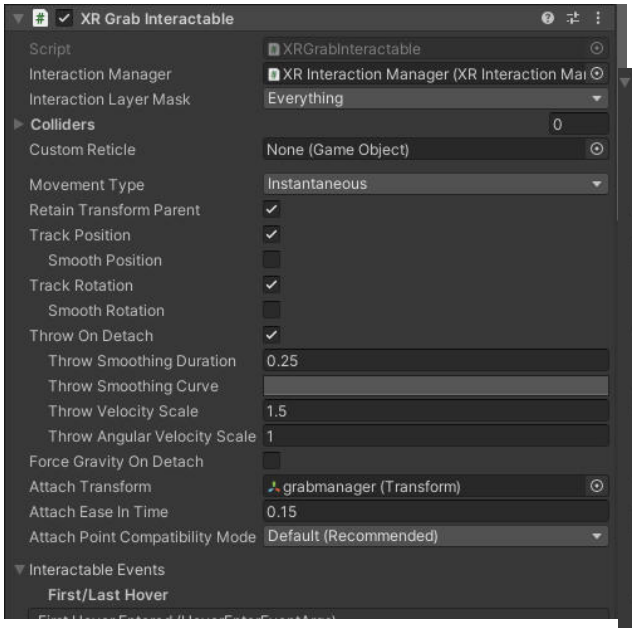


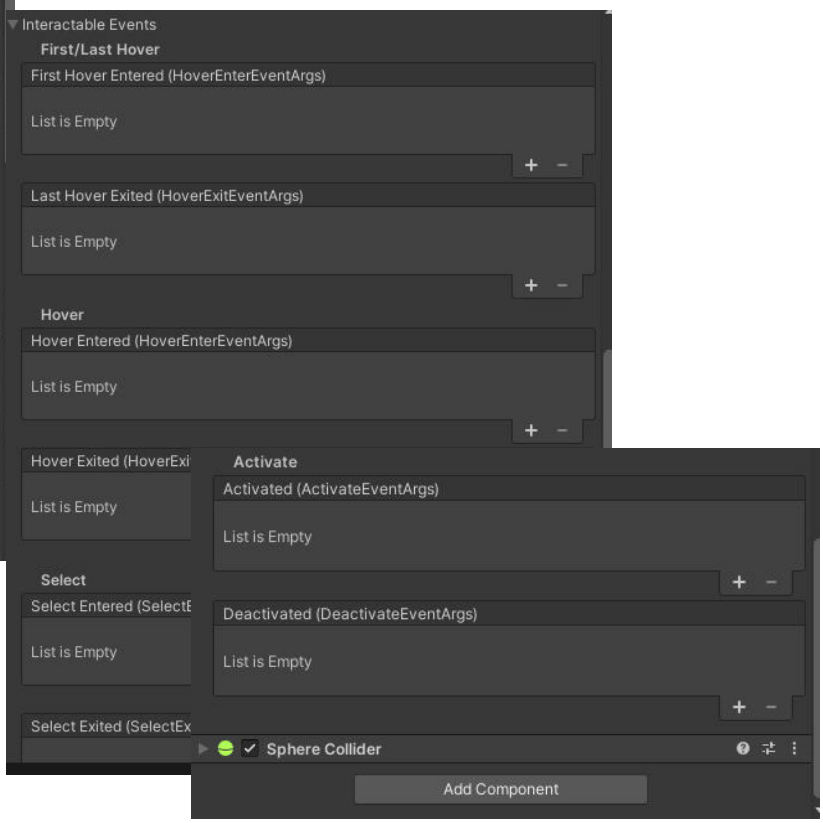




XR interactable Script:

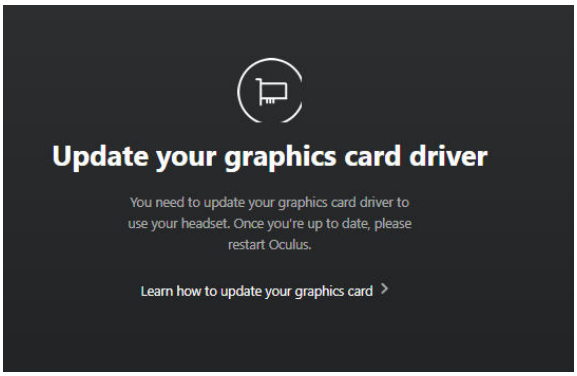
Each interactable object should have a XR interactable component.
It uses XR interactable manager which is given (if not specified, it will choose the first founded
The intractable events are listed and each one finds proper event action from the object activator (or can be refrenced by any object directly. Object activator is just an organizer





Some of problems That I faced:

I was unable to use oculus for debug in because of my outdate graphic.
Solution geting build and install in device.



XR rig Collider does not work in new versions
So for collosion detection I calculated by distance.

```
void Update()
{
    dist = Mathf.Abs(transform.position.x - player.transform.position.x) + Mathf.Abs
    //Debug.Log(dist);
    if (dist < 0.3) {
        Debug.Log("hitteted");
        player.SendMessage("hit");
```

After 2019.4 there is newer input system.
so most of tutorials are out of date.
Even in the Oculus Developer hub, some tutorials are not up to date informaiton.

- In script moving of XR rig: adding character controller or rigid body, is not a good idea.
  I mentioned how handled fly previously. (with adding a parent)
- The size of colliders are important because grabbing things may be difficult.
- There is a camera offset in new XR rig, which is shown in the unity editor, is not the real place after installation (about 1 unit upper)
- UI Canvas should be add Worldvide as child of main camera (not screen overlay) + ser positions 0.01 to the UI canvas to be seen. (it has a high 10000 value at start.)

after all these were for my case - that I couldn't debug with oculus in pc and made my progress slow.

Thank you for your time!
Finish!

salar.rezayani@gmail.com