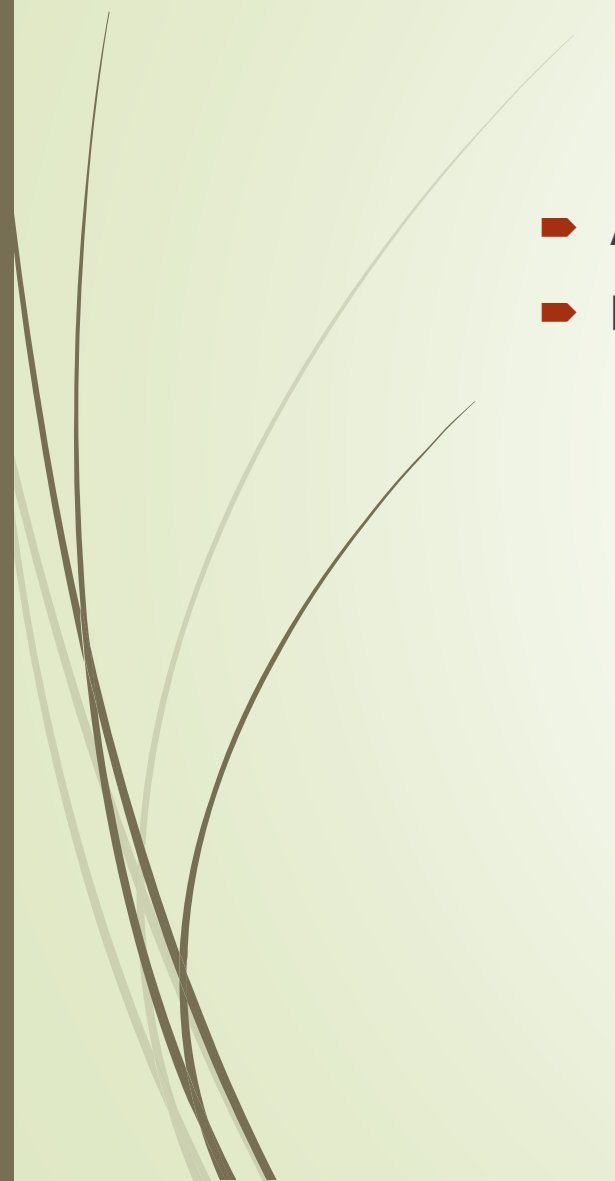




AI Basic

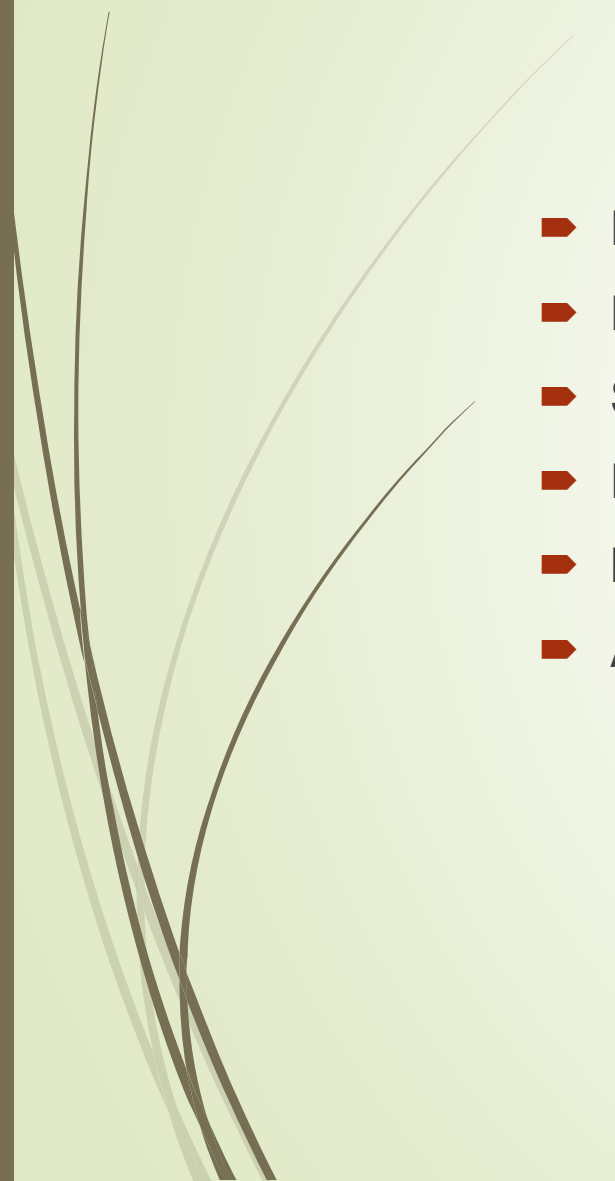


Nội dung

- AI là gì?
 - Một số hệ thống AI
- 



Một số hệ thống AI

- Path – finding
 - Flocking
 - State Machines
 - Rule-based expert Systems
 - Neural network
 - AI algorithms
- 

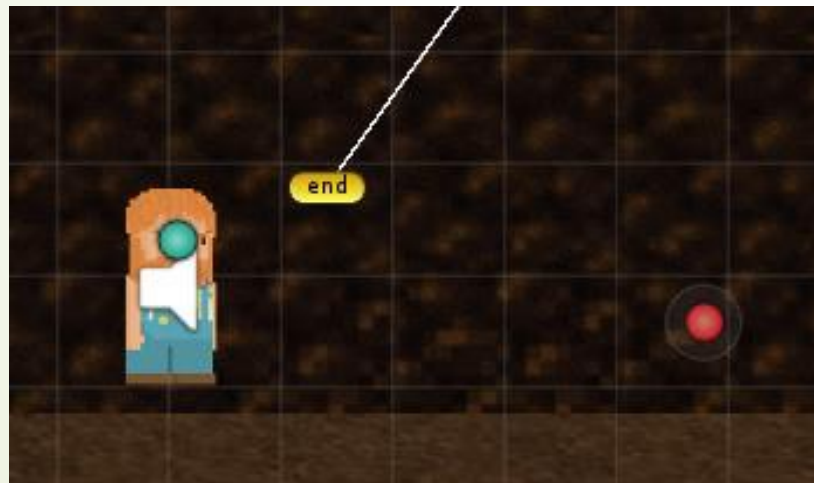


Laycast để tìm enemy

- <https://www.youtube.com/watch?v=C7CLoVYNT7I>
- Nếu Enemy tới gần đối tượng thì tự động bắn phá

Player tự bắn khi nhìn thấy Jumper

- Tạo gameobject startSight, endSight






Player tự bắn khi nhìn thấy Jumper

- ▶ Viết script cho Player - `playerControl`



playerControl script



```
public bool spotted = false;  
public Transform startSight, endSight;  
public GameObject bullet;  
private int numberBullet = 10;  
private float timeDelay = 0;
```



playerControl script

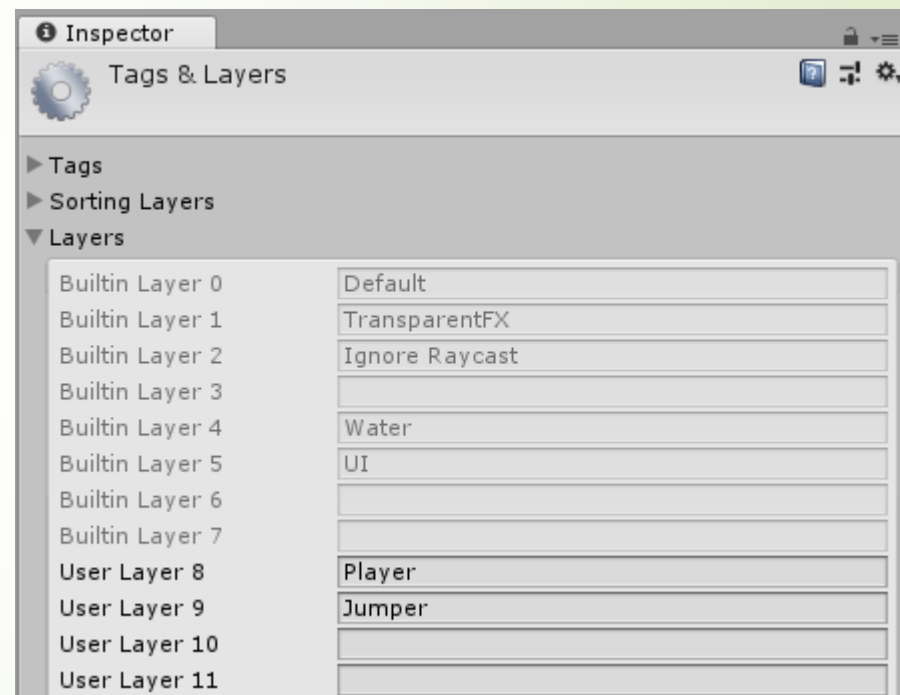
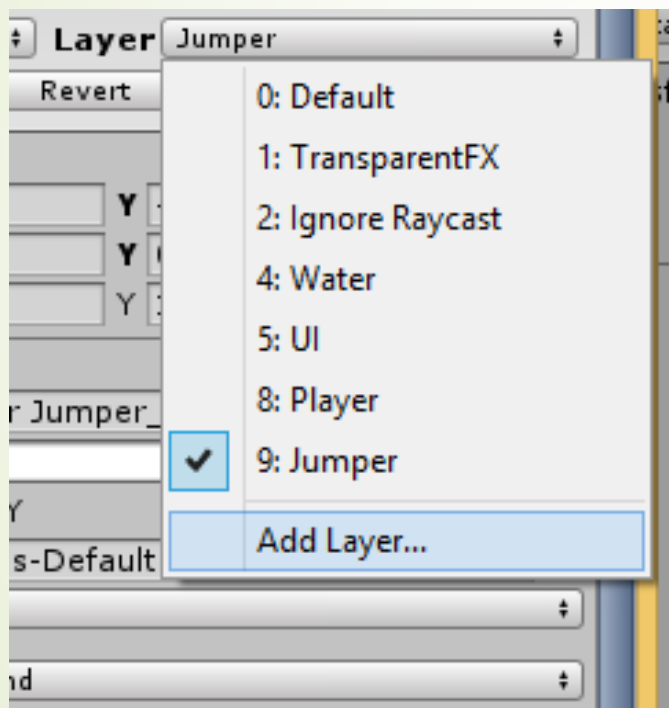
```
void FixedUpdate () {  
  
    PlayerKeyboard();  
  
    Debug.DrawLine(startSight.position, endSight.position, Color.red);  
    spotted = Physics2D.Linecast(startSight.position, endSight.position, 1 <<  
    LayerMask.NameToLayer("Jumper"));  
  
    timeDelay += Time.deltaTime;  
    if (timeDelay>0.5f&&spotted&&numberBullet>0){  
        Attack();  
        timeDelay = 0;  
    }  
}
```




playerControl script

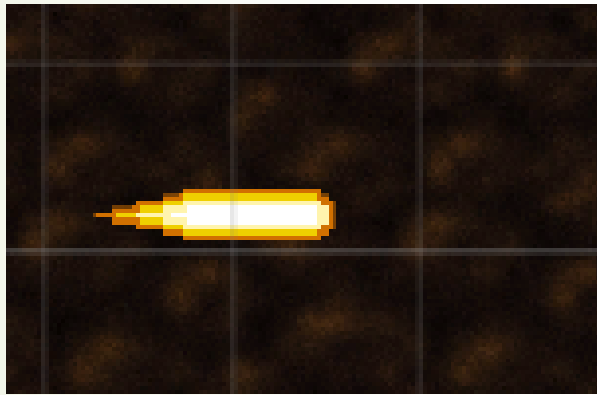
```
void Attack()
{
    numberBullet--;
    if (gameObject.transform.localScale.x == 1)
    {
        GameObject body = Instantiate(bullet, transform.position, Quaternion.Euler(new Vector3(0, 0, 0)));
        body.GetComponent<bulletPlayer>().Shoot(1);
    }
    else
    {
        GameObject body = Instantiate(bullet, transform.position, Quaternion.Euler(new Vector3(0, 0, 180)));
        body.GetComponent<bulletPlayer>().Shoot(-1);
    }
}
```

Tạo layer cho Jumper



Game Object bulletPlayer

Viết script bulletPlayer cho gameObject bulletPlayer





bulletPlayer script

```
public int direction = 1;  
private bool shot = false;
```

```
void Update()  
{  
    if(shot)  
        Attack();  
}
```

```
public void Shoot(int dir)  
{  
    direction = dir;  
    shot = true;  
}
```



bulletPlayer script

```
void Attack()
{
    Vector2 temp = transform.position;
    temp.x += direction*5 * Time.deltaTime;
    transform.position = temp;
}
```



bulletPlayer script

```
public void OnTriggerEnter2D(Collider2D collision)
{
    if (collision.gameObject.tag == "Jumper")
    {
        collision.gameObject.SendMessageUpwards("Damage", 1f);
        Destroy(gameObject);
    }
    if(collision.gameObject.tag == "Border") // dung duong bien
    {
        Destroy(gameObject);
    }
}
```



Spider Jumper script

```
public int health = 10;
void Update()
{
    if (health < 0)
        Destroy(gameObject);
}
public void Damage(int dm)
{
    health -= dm;
}
```

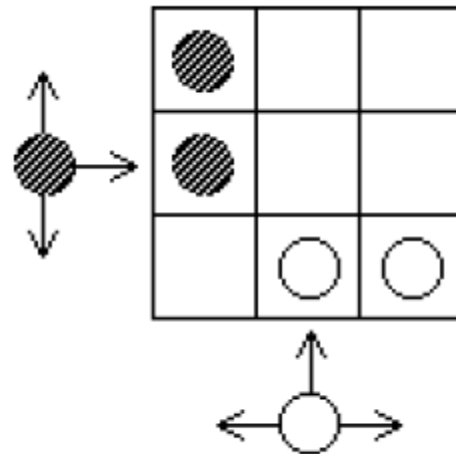
Súng bắn theo hướng nhân vật

```
public class Gun : MonoBehaviour {
    GameObject Target;
    void Start () {
        Target = GameObject.Find("Player");
    }
    void Update () {
        Vector2 Direction = Target.GetComponent<Transform>().position - transform.position;
        float angle = Mathf.Atan2(Direction.y, Direction.x) * Mathf.Rad2Deg;

        Quaternion rotation = Quaternion.AngleAxis(angle, Vector3.forward);
        transform.rotation =
            Quaternion.Slerp(transform.rotation, rotation, 2f * Time.deltaTime);
    }
}
```

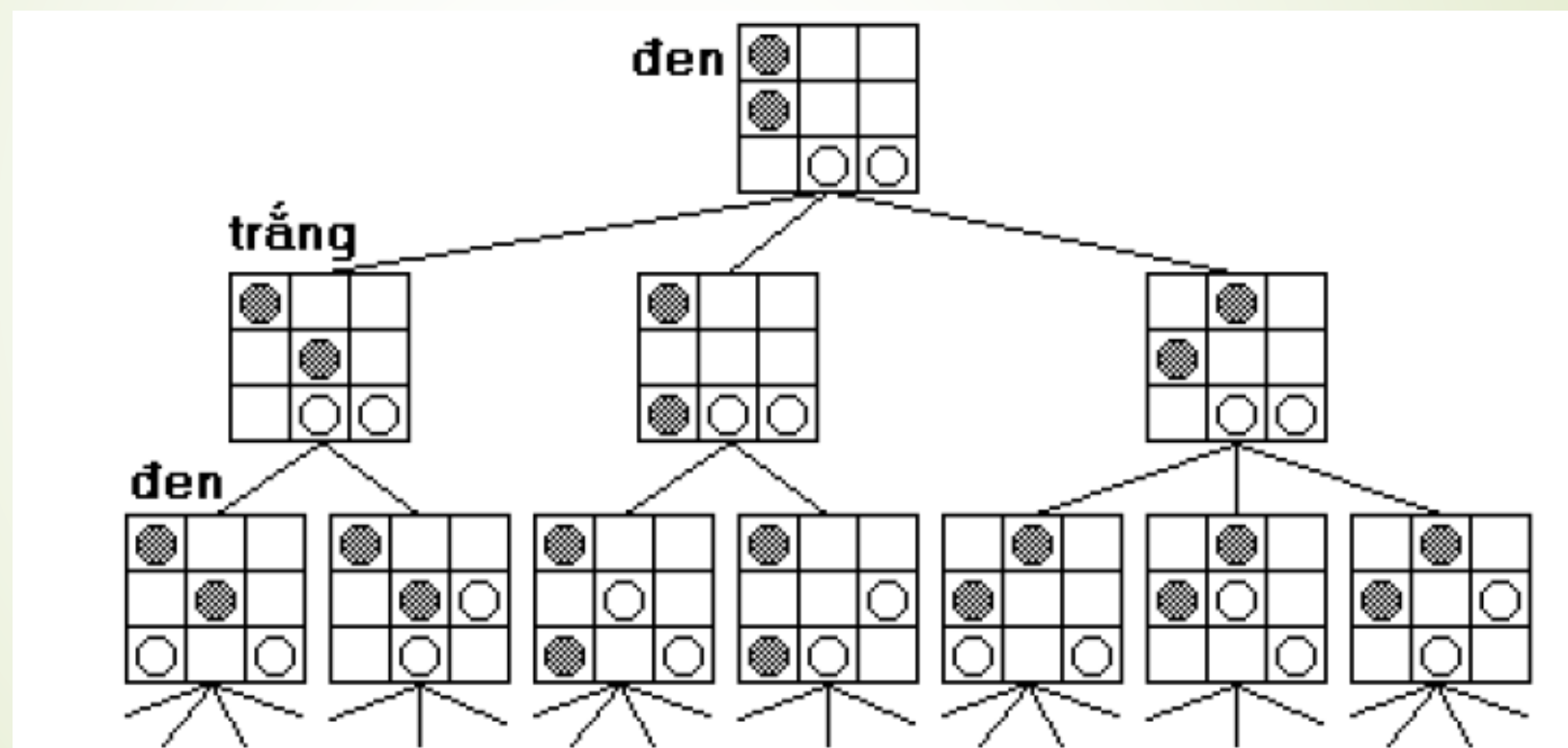

Tìm kiếm có đối thủ

➤ Dodgem

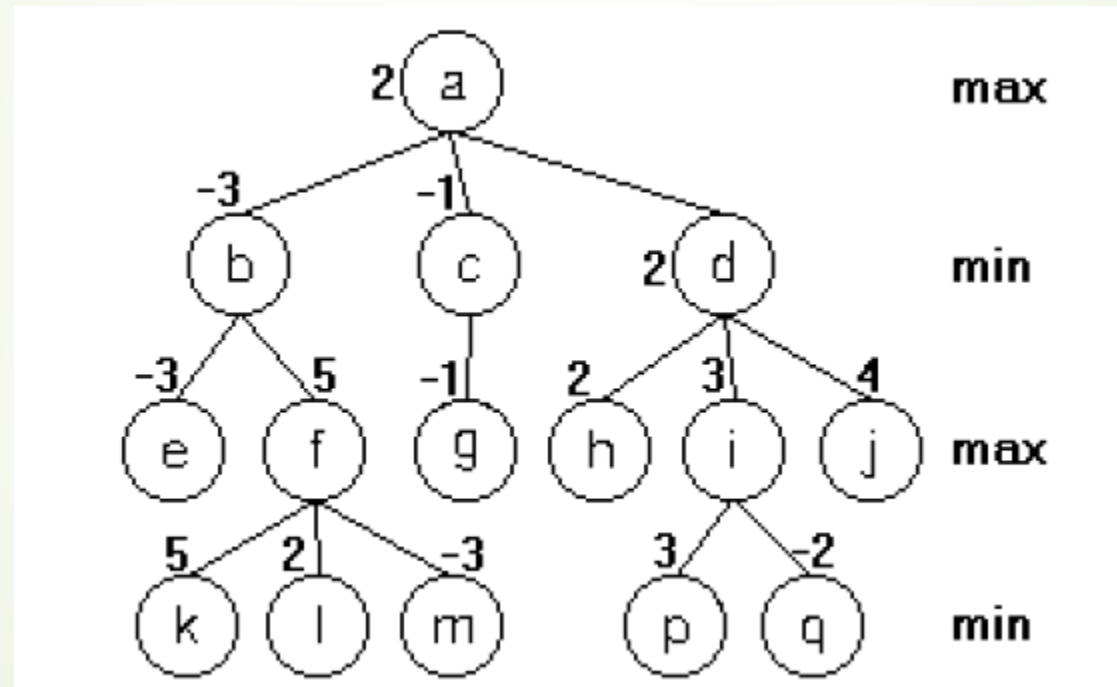


Hình 4.1 Trò chơi Dodgem.

Cây trò chơi quân đen đi trước



Chiến lược Minimax



Giải thuật

```
function MaxVal(u);  
begin  
    if u là đỉnh kết thúc then MaxVal(u)  $\leftarrow f(u)$   
    else MaxVal(u)  $\leftarrow \max\{MinVal(v) \mid v \text{ là đỉnh con của } u\}$   
end;
```

```
function MinVal(u);  
begin  
    if u là đỉnh kết thúc then MinVal(u)  $\leftarrow f(u)$   
    else MinVal(u)  $\leftarrow \min\{MaxVal(v) \mid v \text{ là đỉnh con của } u\}$   
end;
```

Giải thuật

```
procedure Minimax(u, v);  
begin  
     $val \leftarrow -\infty$ ;  
    for mỗi w là đỉnh con của u do  
        if  $val \leq MinVal(w)$  then  
            { $val \leftarrow MinVal(w)$ ;  $v \leftarrow w$ }  
end;
```



Một số game có đối thủ

