

Gebze Technical University
CSE 462 Augmented Reality
Final Project

GTU Jenga – The Game in Augmented Reality

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The Jenga Game:

The game have have 48 blocks and it is a multi/single game which user can interaction existing block of tower. User must be avoid collision and try to increase tower from bottom to up. In game, GTU jenga is smilar like real game but user can interaction existing blocks of tower via **ARCamera**.

Image Target:

User need to this image targer for start the game and create the tower.



When User device's camera see this target, the world (tower and plane) will be create(re-apair).

Lights:

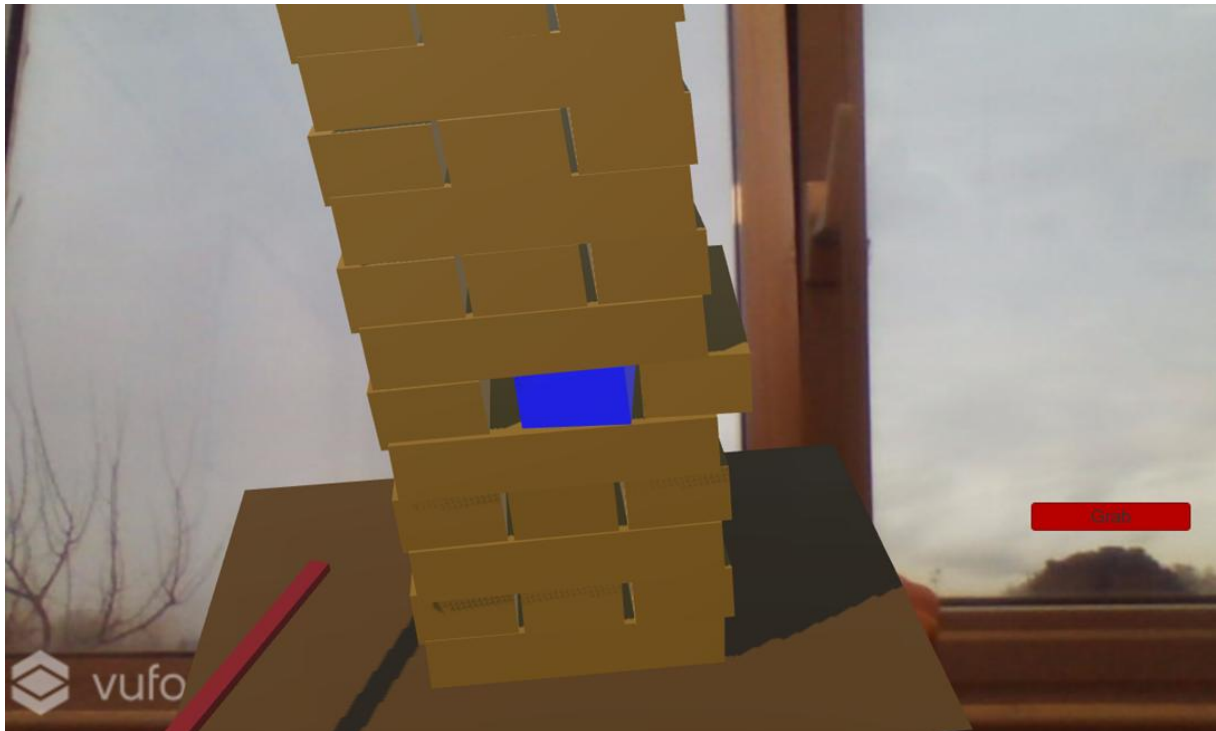
There are one directional light in the Project for lighting.

Creating World:

When image target detected, a tower is creating on plane(on image target). Tower is already designed before detect target.

Selecting:

If user want to select an Jenga object, user need to touch on object which user want. After touch an object one time, user have 5 seconds for move the jenga object. If user keep to move the jenga object, user need to touch the object again one time.



A ScreenShot while select an jenga object.

Moving:

If there are selection a block on tower, user can move the object via camera position.(back, front, left and right)

When user touch on an jenga object, I saved position ARCamera and Block position.

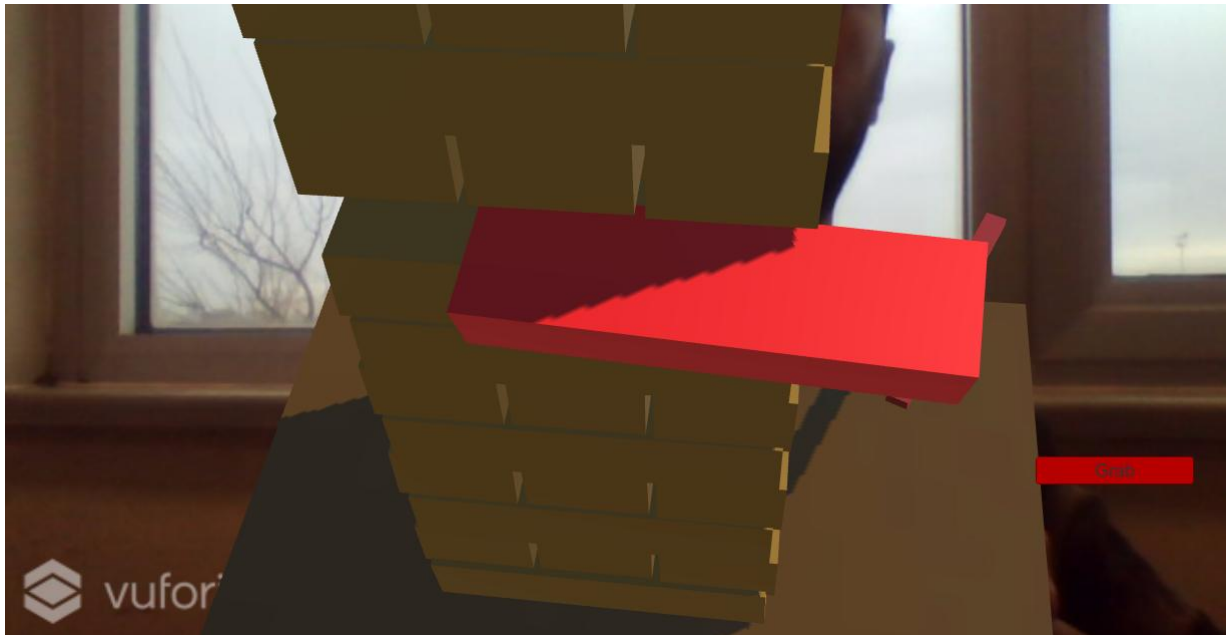
```
xCam = camera.transform.position.x;
yCam = camera.transform.position.y;
zCam = camera.transform.position.z;
```

```
x = jengaPiece.transform.position.x;
y = jengaPiece.transform.position.y;
z = jengaPiece.transform.position.z;
```

Now, User have 5 seconds for move the object via Camera.

I calculating new position of JEnga Block in Update() method.

```
jengaPiece.transform.position = new Vector3
(x - (xCam - camera.transform.position.x) ,
y - (yCam - camera.transform.position.y) / 1.5f,
z - (zCam - camera.transform.position.z));
```



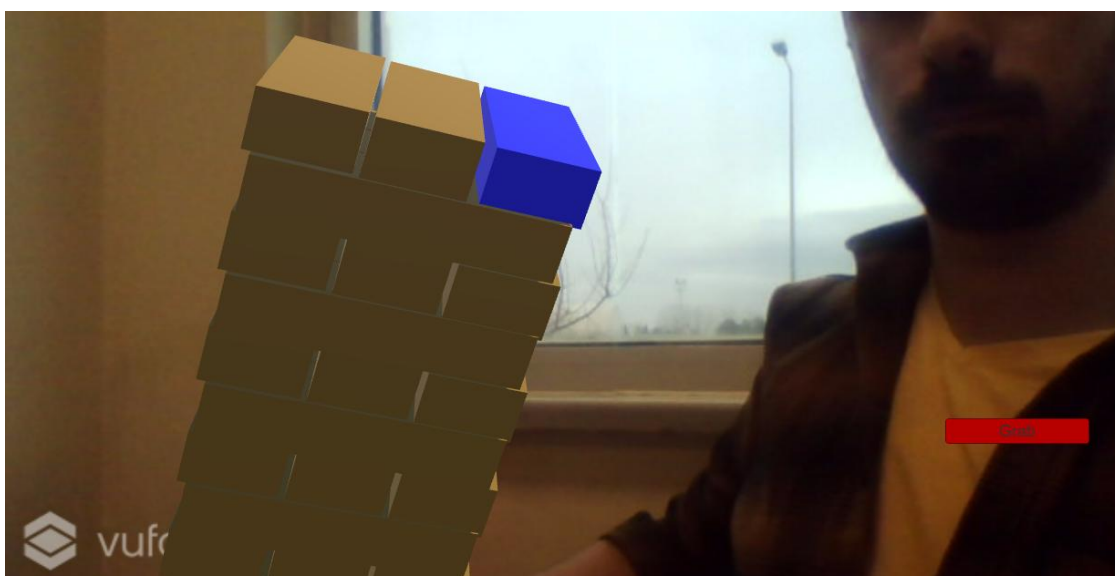
A screenshot while moving an jenga object.

Friction:

On each block, a physics material was added that has dynamic friction, mass, drag, angular drag, gravity. This has the effect of making the tower more stable and playable than if there weren't as much friction between the blocks, but it's need to improve more.

Extended trackable:

Support extended trackable



Collision:

The wand itself also acts a trigger. A collision takes place when the wand interacts with the trigger on the box collider, causing it to fall. There are one planes that exist just slightly above the ground. When a block falls on any one of the planes, the game is over.

**Requirements :**

Development platform: Unity v2018 and Vuforia 6.2; Windows 8.1 and up or OS X (macOS) 10.8 and up.

Deployment target: Android (tested on Xiaomi mi A2) or iOS (not tested)

Missing:

Interface

Game Senerio

Helper buttons

Feedback information

Visual effects