uSim Siege Engines v1.0

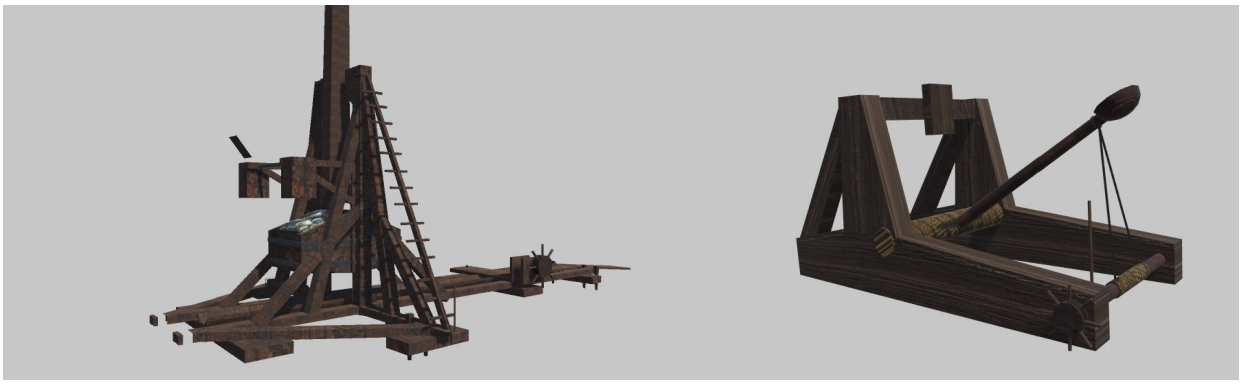
Siege engines provides a 100% unity physics solution to comon siege engines. Component based scripts allows the wraping and handling of the engines trough virtual interaction.

To achieve the simulations Unity physics hinge joints and rigidbody components are set to work together with uSim components to deliver acurate physics based behaviour of the siege engines.

Models and structures can be easily changed to simulate and build different configurations.

V1.0 includes two types of catapults and it's components. The Mangonel torsion type catapult (or Onager).

And the Trebuchet, gravity powered catapult.

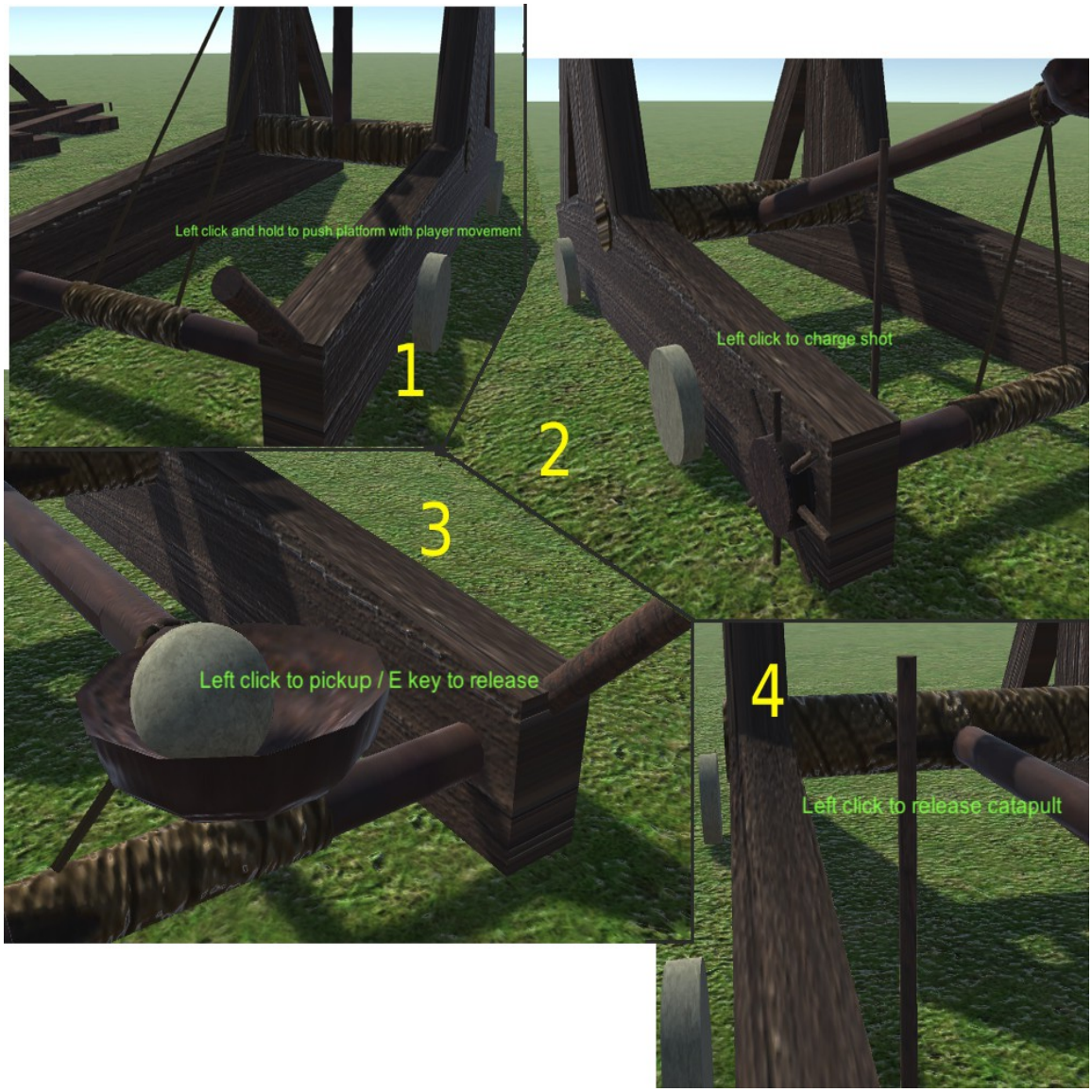


OPERATION

Both catapult use same components to handle the charging, loading and releasing actions.

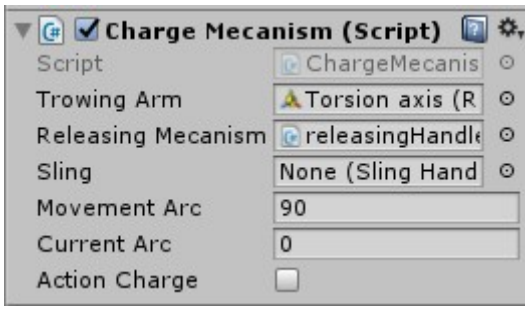
This actions are:

1. (Mangonel) move into range, align using movable platform.
2. Charge the shot using the charging wheel. Actionate until the arm is in the trowing position.
3. Pickup a munition from the ground by clicking on it. Load the munition holder by pressing E to release the munition on top.
4. Pull from the release handler by clicking on it. This will release the trowing arm physics to propell the munition. Note that since it's physics based any physical object that fits into the muntion holder can be trowed. Different weights affects the shot.
5. In the Trabuchet case, the counterwight load can be changed by left and right mouse clicks on it. This changes the range of the shot.



MAIN COMPONENTS

Charging Mecanism:



Trowing arm: the arm rigidbody.

Releasing Mecanism: the releaseing script.

Sling: if has sling “Sling Hander” goes here.

Movement arc: the max charging angle.

Action Charge: while true charging is enabled.

Releasing Mecanism:

Locked: prevents the catapult from being released.
Release Command: while true the trowing arm physics are active.
Released: set to true when the arm is released.
Trowing arm: the arm rigidbody.

Releasing Handler

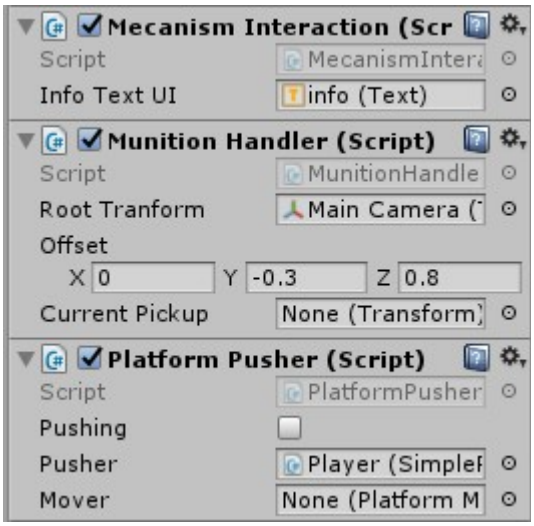
Pivot: the pivot (base) of the handler. It will rotate 45 deg while beeing pulled.
Release Mecanism: the mecanism to act on.

Sling Handler:

The Trebuchet has a sling type muntion holder in the end of the arm. In order for the munition to exit properly when the arm in on the apex this script simulates the “ring/finger” mecanism used in Trebuchets. Basically, during the release when the vertical speed of the arm tip starts to decay (apex) the top anchorage of the sling is detached (the ring travels along the finger due to centrifugal force) to ensure proper release of the munition.

Detaching Anchorage: The hing joint that is released. (the ring)
Release Collider: To help keep acurate exit angle a collider that holds the munition while trowing is dissabled.
Release Time: this represents the time it takes for the “ring” to travel along the “finger”. Adjust this to modify the trowing angle.

Interaction scripts:



Mecanism interaction

This handles the interaction and UI info of the components trough raycasting of the components colliders.

Munition Handler

When a munition is picked up this sets the local position and parent.

Platform Pusher

Movable platform (mover) is pushed via this script.

Make sure this scripts are present and setup in your Main Camera

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