**AG231 Lab03**

**Technical Document – Rev2**

**Teleporting to the top of a surface that a raycast can’t see**

What happens when you want to use a raycast hit point to teleport to the top of an object, but the ray cast has no way of “seeing” the top? (There’s a nice diagram of this situation drawn in link c) of the Help Links section of this document.) You could play games with special colliders to work around this constraint, but that’s not the solution I’m looking for i.e. These aren’t the droids you are looking for.

If you choose to use a quadratic Bezier curve here are some thoughts as to what you could do as an overview.

One potential solution involves using a Lerp, a quadratic Bezier equation (with a start, end and control point), and a Line Renderer to draw line segments. If a ray-cast for one of those line segments (needed to draw your curve) intersects with the collider on another object you can figure out the hit point.

How to modify the curved ray’s trajectory based on the controller’s vertical angle is another issue. If you implement a parabolic curve as described in the second and third links, under the Help Links section, you’ll find things are much easier to implement. For the Bezier curve more thought and work is required.

For example, consider that the higher you point up, the less x-z plane horizontal distance your curved line traverses, and the higher the curve goes up before returning back down. I can share with you some ideas you might want to consider if you’re having a hard time figuring out how to implement this mechanic.

**Help Links**

* Bezier Curve Line Renderer - 20:57 minutes
  + - <https://www.youtube.com/watch?v=tgCFzoG_BJM>
* Teleport Curves with the Gear VR Controller
  + - documentation with some animations – describes Bezier and parabolic
    - <https://developer.oculus.com/blog/teleport-curves-with-the-gear-vr-controller/>
* Developing an A-Frame Teleport Component – documentation about parabolic
  + - <https://aframe.io/blog/teleport-component/>
* Bezier Curves Explained - 3:03 minutes
  + - <https://www.youtube.com/watch?v=pnYccz1Ha34>
* Draw Debug Information in the Unity Editor with Gizmos - Quick Tip
  + - 4:54 minutes
    - <https://www.youtube.com/watch?v=S7HfszIEAAY>