Ex7 – Shirley Haimoff (206145245) and Zohar Hen (206092991)

Final project proposal:

We decided to imitate breaking a glass ceiling, in a way that will demonstrate the hard work and journey this should take.
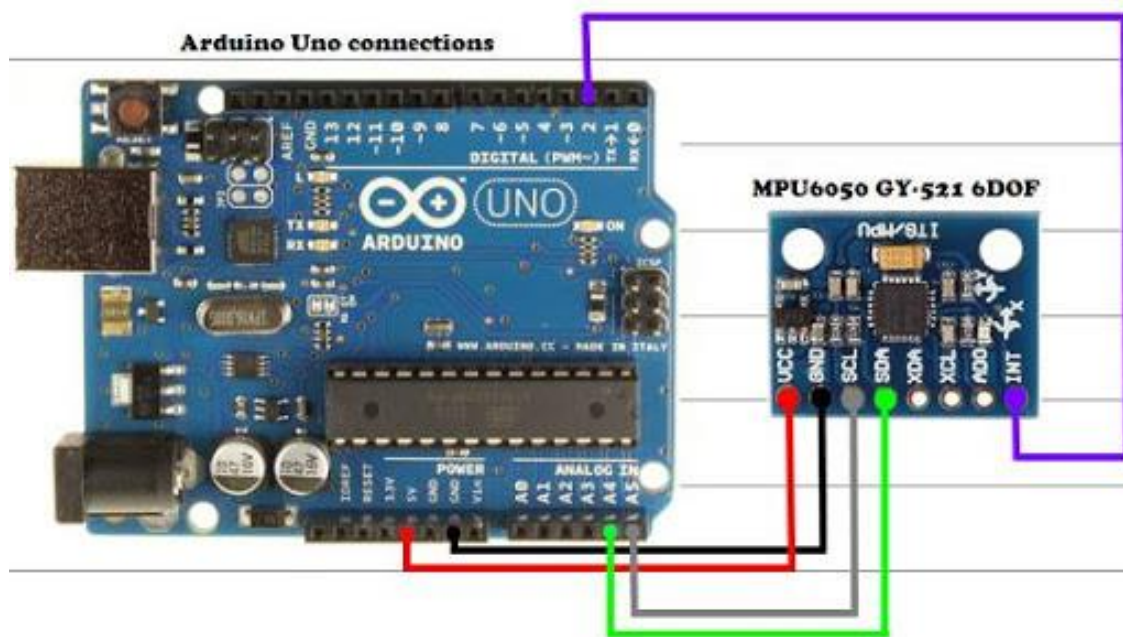
For this purpose, we chose the physical agent to be a real-size hammer, printed as two separated parts - a hammerhead and a handle, connected with an axis, so the hammerhead will be straight only when the object is in a horizontal orientation, and the flat side of the hammerhead is pointed to the ceiling (see physical agent in illustration below).

The virtual agent, shows a visualization of a glass ceiling, which will be projected on the ceiling using a projector, implying to the user in which direction the hammer should be pointed. Despite the above, it still might take a while until the user gets the correct direction to use hammer –which is fine because even in real life it is a difficult and an unclear process. Therefor the user may take time to understand the right way to do it.
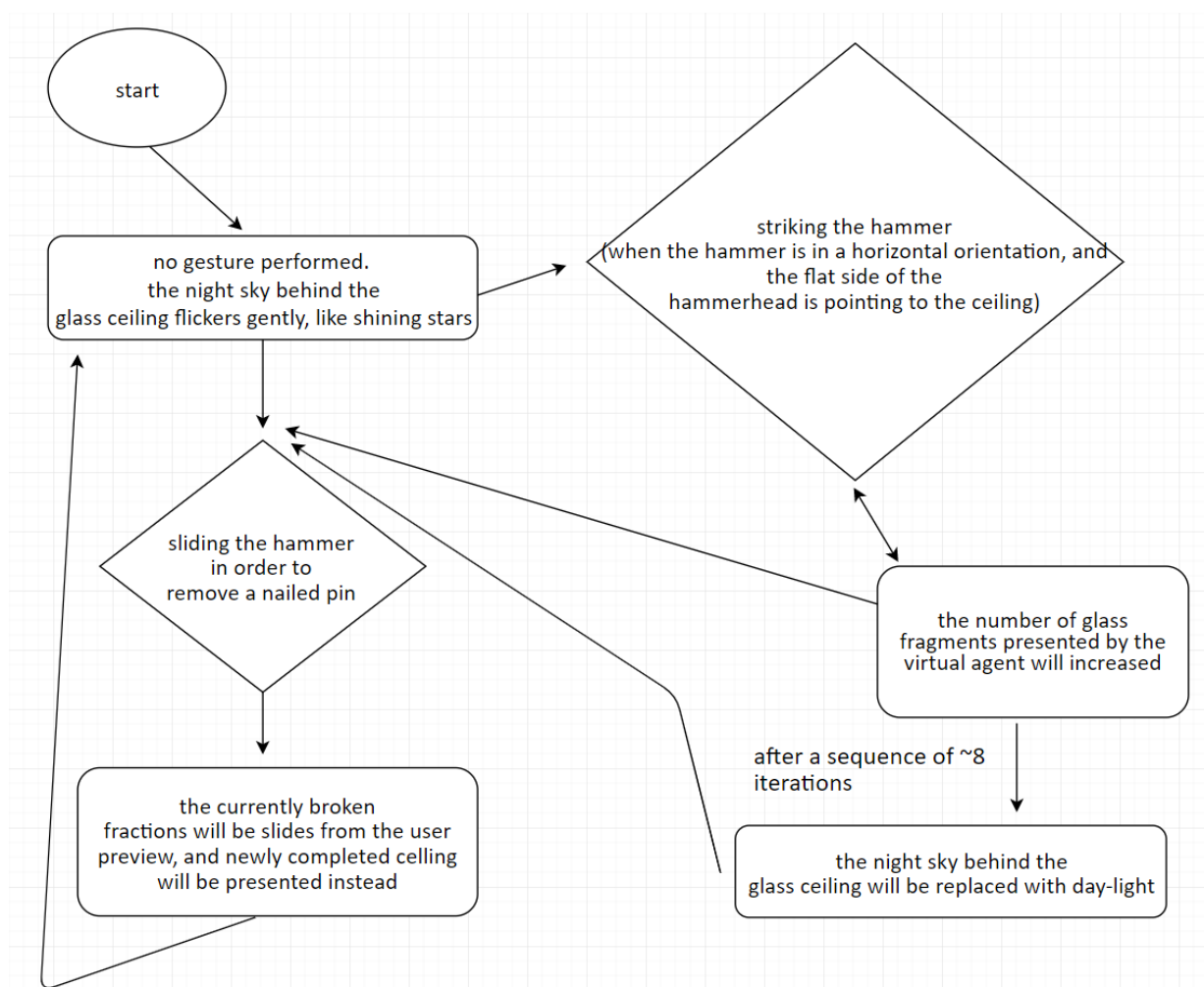
Using the accelerometer, hiding inside the hammer handle, we will recognize 4 different kinds of gestures:
   a. Static state (default, when there are no gesture) – the night sky behind the glass ceiling flickers gently, like shining stars. We chose to present the night sky not only because the glass ceiling will be much clearer this way – but also because the shining stars represent dreams and goals one wants to achieve by breaking the glass ceiling.
   b. Simple gesture 1 - striking the hammer (when the hammer is in a horizontal orientation, and the flat side of the hammerhead is pointing to the ceiling): There are ~8 steps until the celling is completely broken, with each knock the number of glass fragments presented by the virtual agent will increased.
   c. Simple gesture 2: sliding the hammer in order to remove a nail (same orientation as in B but using the other side of the hammerhead): When performing this gesture, the currently broken fragments will slide from the user preview, and a newly completed celling will be presented instead.
   d. Complex moves – after a sequence of ~8 iterations of gesture b (striking the hammer), the night sky behind the glass ceiling will be replaced with day-light, notifying the user that mission was accomplish.

1. **Technical drawing of the electronic circuit:**

Arduino Uno connections

2. Flow diagram:

start

no gesture performed.
the night sky behind the
glass ceiling flickers gently, like shining stars

striking the hammer
(when the hammer is in a horizontal orientation, and
the flat side of the
hammerhead is pointing to the ceiling)

sliding the hammer
in order to
remove a nailed pin

the number of glass
fragments presented by the
virtual agent will increased

after a sequence of ~8
iterations

the currently broken
fractions will be slides from the user
preview, and newly completed celling
will be presented instead

the night sky behind the
glass ceiling will be replaced with day-light

3. System illustration (real drafts):

a. Physical agent
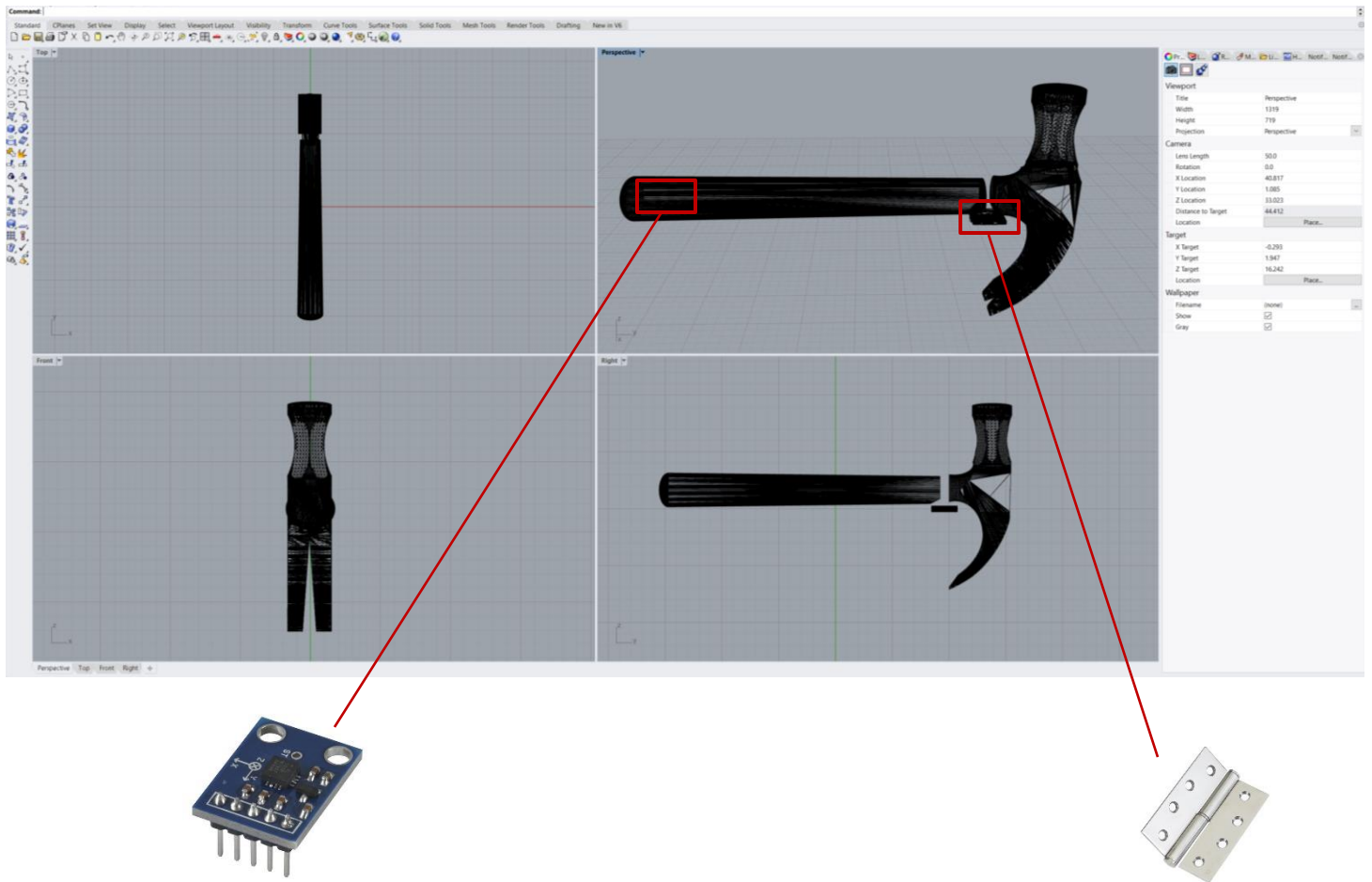
b. Virtual agent (yet to be completed)