3. avoiding recoil from the motion of striking the ball

The end-effector will be required to strike at many levels of force in order to score from different positions on the table. Some of the more powerful shots may induce large amounts of recoil in the robotic arm. In order to avoid interfering with the other balls on the table and to avoid damaging the system, the recoil from a shot must be mitigated.

To effectively mitigate the recoil of the end-effector, a real-time control system must be implemented. The control system will invoke a force opposite to the recoil of the system in order to maintain the stability of the system.

4. controlling the force at which the end-effector strikes so that it can score from different positions on the table

Since the system will be required to make shots from most positions on the billiards table, the end-effector must strike at a variable force. After the system takes an image of the table, and processes it through the VR software, it will calculate a vector for the end-effector to strike.

Once the system calculates the vector, it will send the distance value to the arduino. Using the distance value, the arduino will then calculate the optimal PWM value to send to the actuator that controls the end-effector's striking motion.