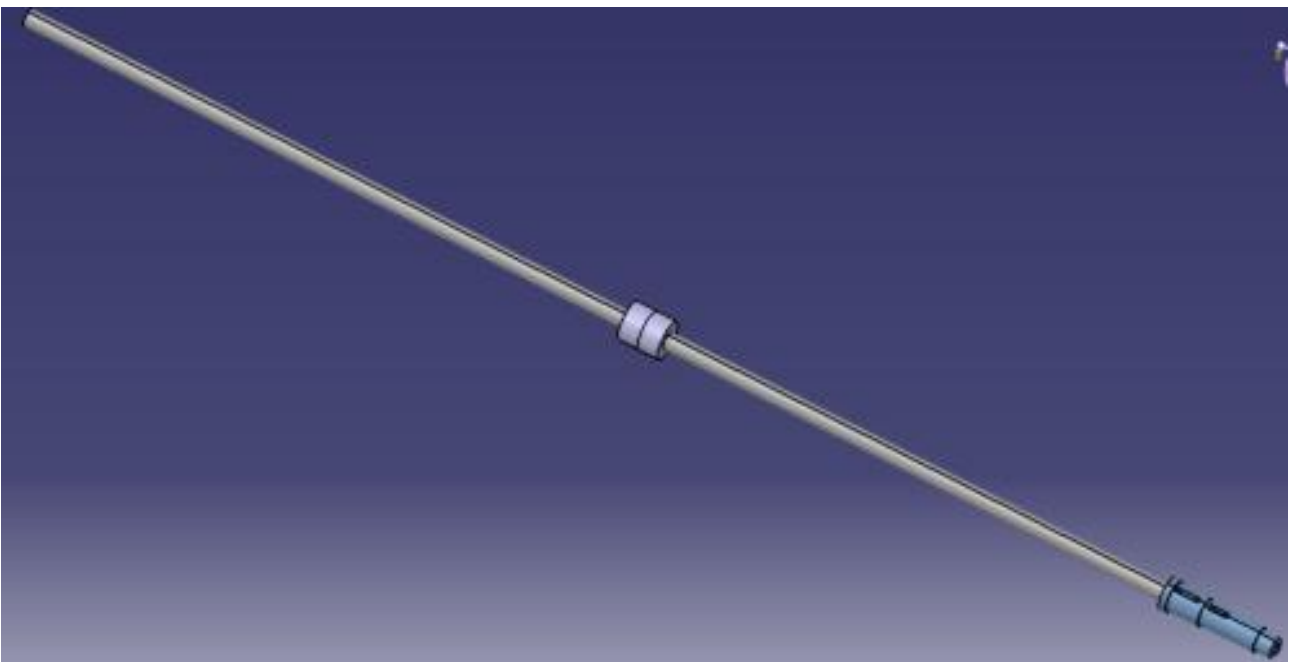
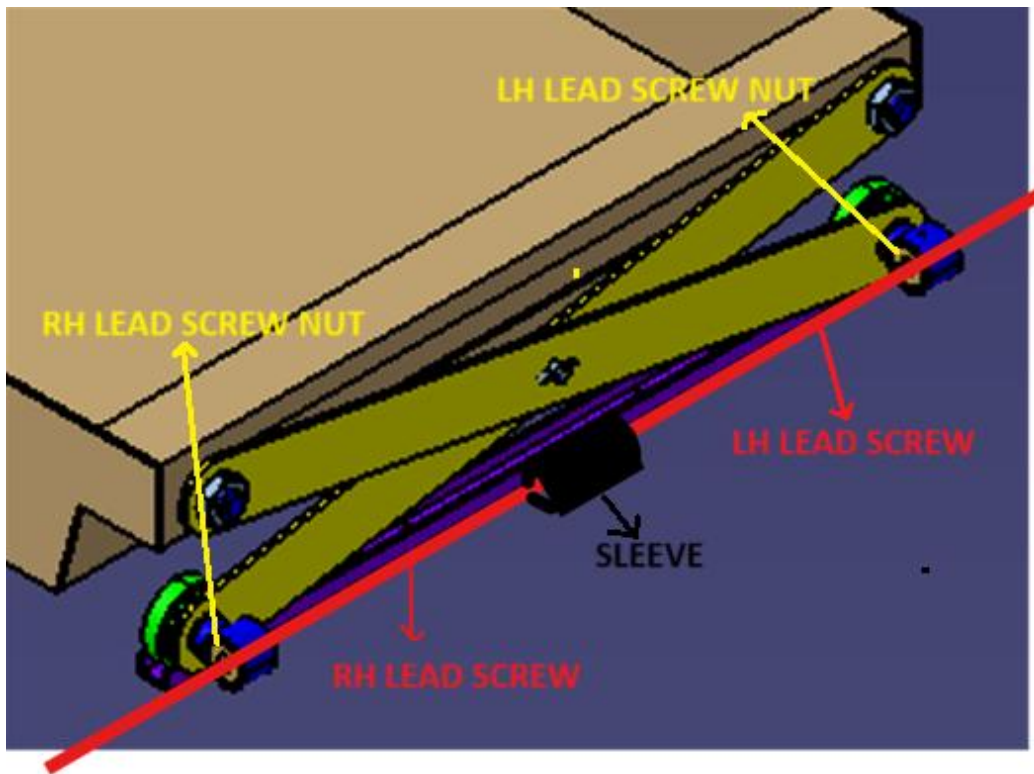


Unlike standard scissor lifts, where one side remains fixed while the other moves due to lead screw rotations, as demonstrated in an initial handmade prototype (crafted with the help of my father), our design required the centre of gravity of the charcoal basket to remain in the middle of the basket due to safety reason.

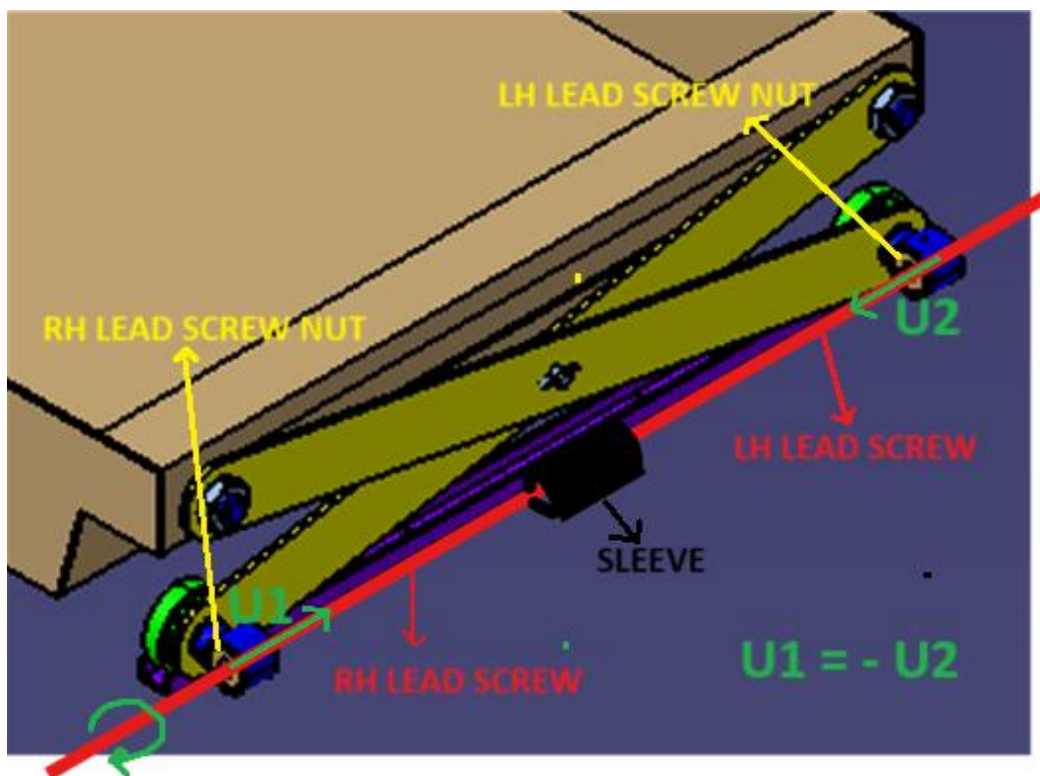
To achieve this, I implemented a double trapezoidal lead screw system. This system uses one right-hand screw and one left-hand screw of the same pitch, connected by a mechanical sleeve. The 3D models of the standard parts were downloaded from TRACEPARTS.



Each lead screw is paired with a corresponding lead screw nut (one right-hand and one left-hand) attached to the two arms of the scissor mechanism.



This system ensures that for every rotation of the lead screws, the two lead screw nuts experience displacements of equal magnitude but in opposite directions. This synchronized movement maintains the central position of the charcoal basket.



Simulations

Kinematic simulations were performed specifically on the roller chain assembly.

Structural simulations were conducted on the supporting frame assembly to analyse its integrity under load.

Unfortunately, since it was not required and due to time limitations, we have not been able to have a physical prototype of the entire system.