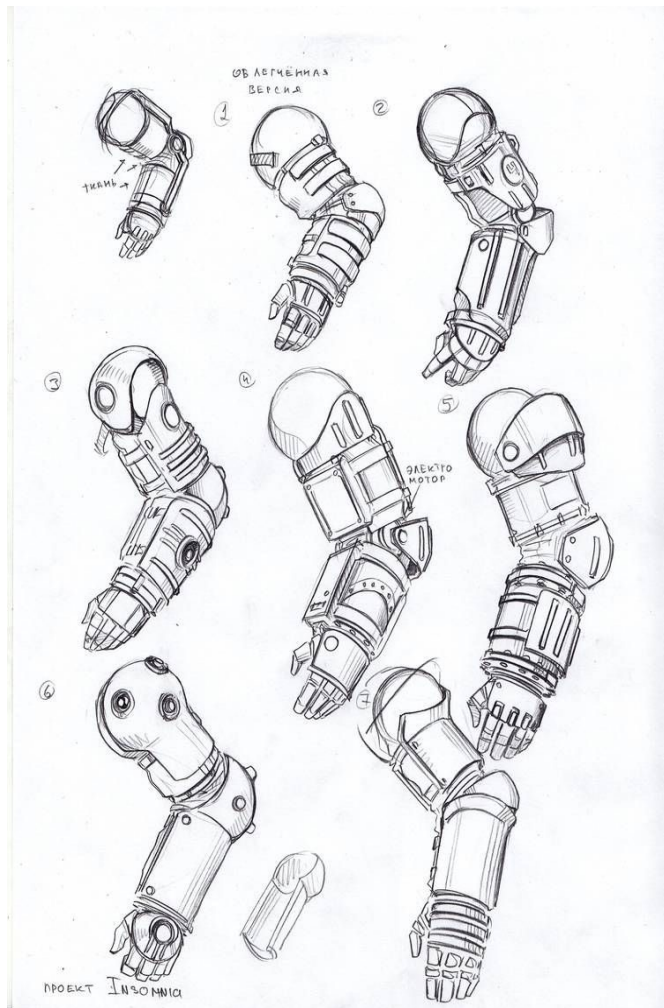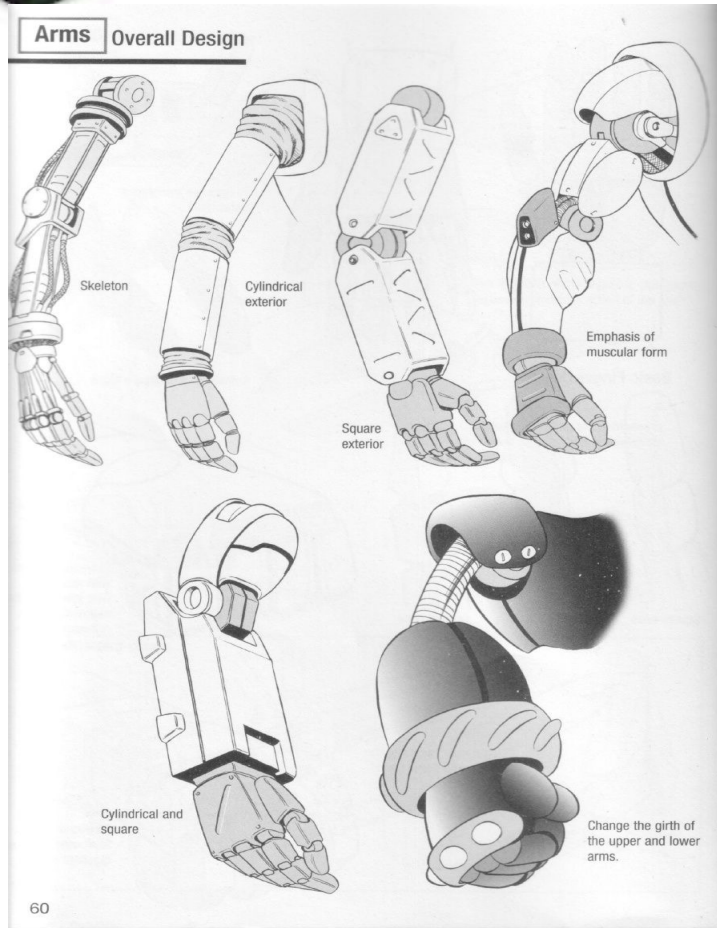# MATHEMATICAL MODEL

Eng: Rafa Saif

01
Problem definition

I have written this mathematical document for the evaluation robot arm to ensure safe areas and dangerous areas, as well as identify areas where sensors will be located to ensure the highest level of guarantee and reduce errors.
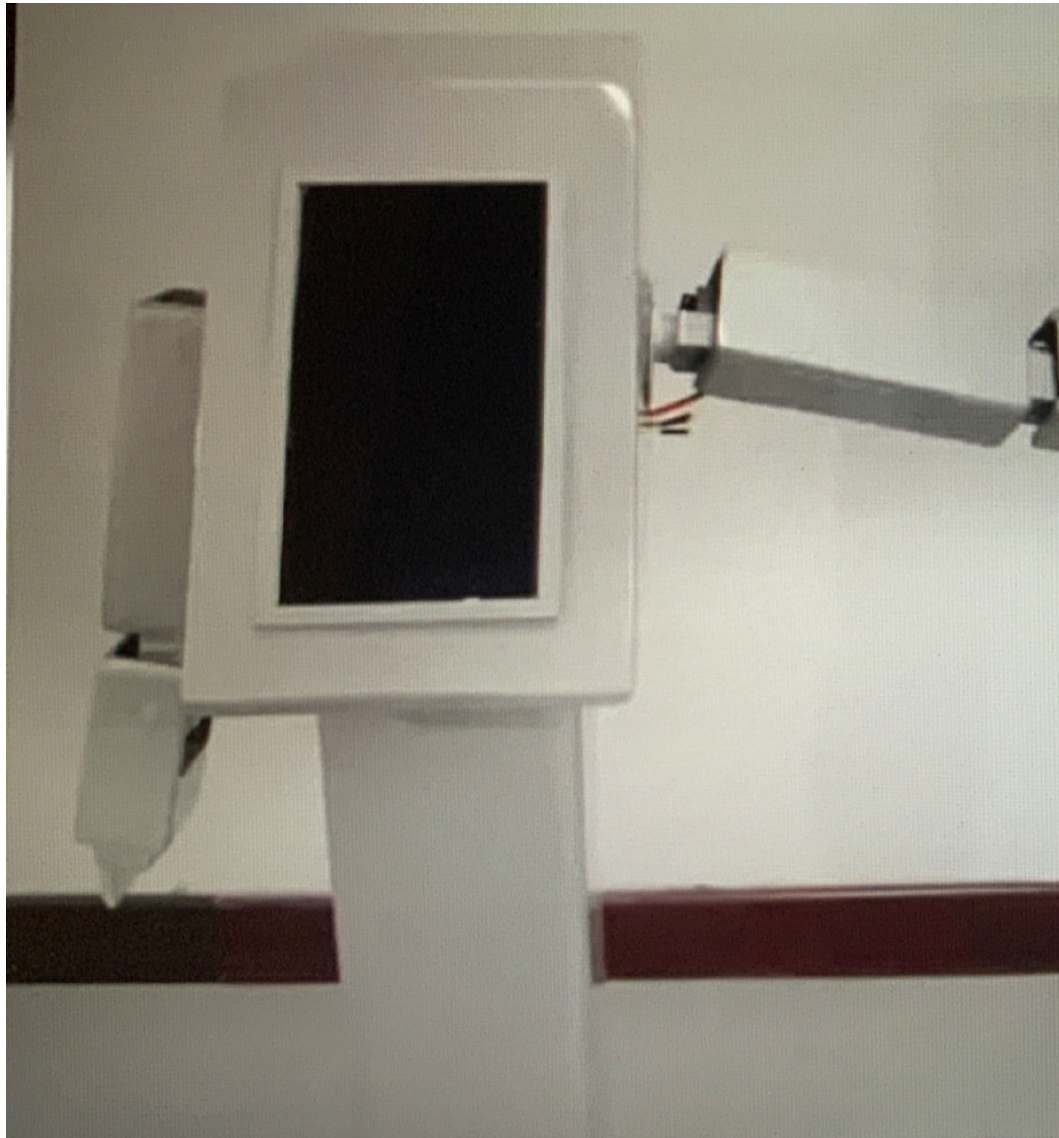
02
Variables

First, we must determine the movements of the robot:

- When the robot arm is moving in three dimensions, we will use the (X, Y, Z)

- When the robot arm is moving in 2D, it will look like this (X, Y)
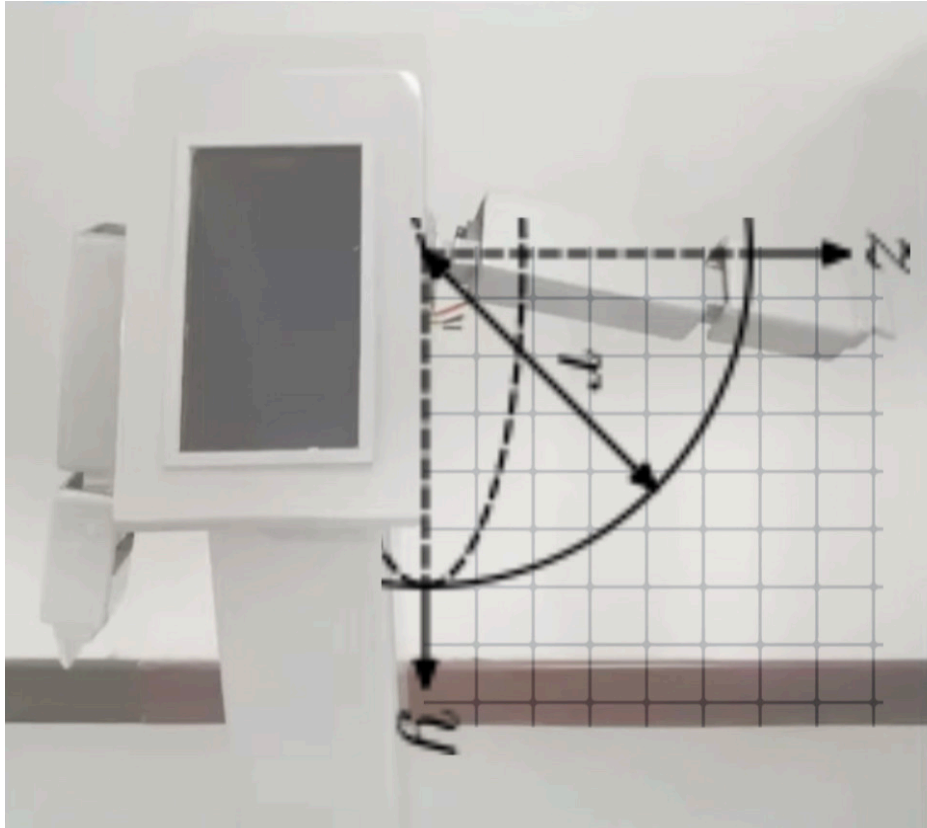
But I will explain in 3D.

03
Opereation

I used the law for the 1/4 volume of a sphere, which states:

$$(V = (3/4)\pi\, r\text{\textasciicircum}3)$$

Using this law, we will determine the area in which the arm is allowed to move.

04
Implemntation

In 3D model the allowed area for the robot arm to move is:

$$V = 1/4*3/4*\pi (42.5)^3 = 45218.68566$$