A picture containing text, indoor, device, lined

Description automatically generatedNewton’s second law describes the acceleration of the ball,   :

Where,

Then,

+

+

From here we need to find a relationship between the position of the ball, and the motor voltage. So,

We find the relationship from our output, and our input with this equation.

Parameters:

are all constant

are the output and it’s derivatives

is the are speed as a function of the input.