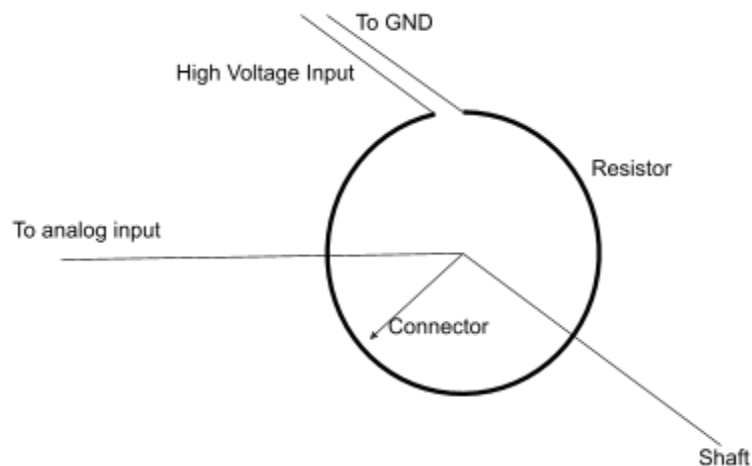


Mechanical Subsystems

Q1 Motor Encoder

The motor encoder can be designed which connects to the motor shaft. Here, to make a high accuracy motor shaft, we can use a potentiometer to do the same. For this we will take a coiled resistor and a moving connector which will connect to the shaft of the motor. Now potential applied will be spread uniformly through our resistor, and as our rotor rotates, it will change the potential across the connector. From this variable potential value, We can simply calculate the value of angular displacement of the motor. Also increasing/decreasing values of the potential will tell us about the direction of rotation of the motor. This method can give highly accurate values of angular displacement of the rotor.

If we take the values of potential as analog input, we can have a maximum of 1024 values. This implies that the least count of the system (in best case) can be $360/1024 = 0.35$ degrees (This value depends upon the range of potential, and depends upon the design and packaging of the coil inside our encoder).



2D Schematic Diagram of the Encoder

The encoder can be designed such that it has an inner groove, where the shaft of the motor fits, and rotates the moving part of the encoder, while the stationary part of the encoder fits upon the hub of the motor.