**MAE 598 MEDM: Lab # 3**

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MAE 598: Topic: Mechatronics Engineering for Design & Manufacturing (MEDM)

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**Question - LAB 3**

**Task 1: Build a light-activated motor operation system**

**Task2: Calibrate the rotation speed of the motor using a photoresist.**

* **Measuring the Speed of Rotation with an Arduino, a LED, and an LDR (Light Dependent Resistor)**

**Circuit Schematic Diagram**

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| Figure 1 |

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| Figure 2 |

**Code(s)**

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| Link to code: <https://drive.google.com/file/d/1Cp25CF9OWRD80dmoJzKS_GFar_WpKd82/view?usp=drive_link>  Link to TinkerCad Video: <https://drive.google.com/file/d/18_Pm5GwKIy2DYGC6rN_aKA6F3I5tJ2T6/view?usp=drive_link> |

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| GIF of the circuit in tinkerCAD |

You will see the motor driver short-circuiting in the video link/GIF. This is considering the circuit without the photoresistor activated. Whenever the light source falls on the photoresistor it will provide the voltage input to override the system and provide an input Vcc to the motor to make it start rotating with a 9V input which on activation produces a rotation of 10220 rpm (testing)

**Comments**:

1. Incorporate a photoresistor (LDR) into the circuit and apply voltage to it.
2. When light falls on the photoresistor, it decreases in resistance, leading to an increase in output voltage. The varying output voltage corresponds to analog input values ranging from 0 to 1023.
3. Integrate the L293D Motor Driver IC into the circuit to control connected motors. Use the L293D IC to independently control the speed and direction of two motors. It is used to control the speed and direction of two motors individually and instantaneously.
4. Upon circuit activation, the photoresistor initially transmits zero analog values to the Arduino through input pins. Exposure to light causes the photoresistor's resistance to change, generating analog values ranging from 0 to 1023.
5. Adjusting the analog values to fit within the 0 to 255 range to align with the speed control pin specifications of the L293D IC chip.
6. Transmit the modified analog values to the L293D IC for speed regulation.
7. Send digital signals to the IC for controlling motor direction.
8. Source power from the Arduino to operate the L293D IC and provide power to the motors.
9. Fluctuations in the photoresistor's resistance result in adjusted analog values tailored for the L293D IC chip, ultimately regulating the rotational speed of the motors.

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