Light Tracker

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March 9, 2021

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Introduction

The light tracker was conceived as a way to test a 3-D printed pan and tilt platform.

Chapter 2

Hardware

2.1 Electronics

2.1.1 Micro-controller Requirements

There are four photo-transistors light sensors, thus 4 analog inputs are required. Each stepper motor requires 4 digital output lines. For the two steppers, a total of 8 outputs are required. Should limit switches be added, a few digital inputs will also be required. The micro-controller that I'm using is an Arduino Due, which has ample resources for this project.

2.2 Mechanical

2.2.1 Gearing

Both stepper motors have a 20 tooth gear and are 400 steps per revolution.

The tilt gear has 50 teeth giving a $\frac{2}{5}$ gear ratio. With the gearing, 1000 steps of the motor will completely rotate the tilt frame. This is 0.36°per step or 2.78 steps per degree.

The pan gear has 100 teeth giving a $\frac{1}{5}$ gear ratio. With the gearing, 2000 steps of the motor will completely rotate the pan head, giving 0.18°per steps or 5.56 steps per degree.

Chapter 3

Software