**Collider Mechatronics Interview Assignment**

**Continuous SLA/DLP Printer**

**First, *just read* this document (don’t do the assignment!):**

[**https://docs.google.com/document/d/1fQgPK\_VimzP\_BoGJuBc6QgiCeMI\_WBrZfA4ZZOqCUyU/edit**](https://docs.google.com/document/d/1fQgPK_VimzP_BoGJuBc6QgiCeMI_WBrZfA4ZZOqCUyU/edit)

**1) Based on the knowledge contained within the previous document, go online and source a few Z-Height control systems for a basic SLA/DLP Printer. Specifically looking for:**

**(A) the Motor which performs the motion, and also**

**(B) the system which translates the Motor's motion into movement in the Z-Axis (vertical, in our reckoning)**

**Notes:**

* The Z-Height control system needs to be able to lift and control 10lbs, and to move reliably in .1mm increments.
* We prefer consistency -- so source for that.
* Try to keep costs below $300 for the whole Z-axis system if you can.
* Keep in mind that you will have to write some basic code to control this motor, so please source a motor with good documentation.
* Limit switches do not need to be sourced, and it can be assumed that the motor will never travel beyond its limits.
* As far as other requirements, just use your best judgment, and explain your design choices.
* ***Give us a basic description of your chosen Z-Height control system, including links to any relevant documentation, and provide your reasoning for your choice. This step is very important, so please give us a lot of detail as to the systems you looked at, and why you chose this particular configuration.***

**2) Choose a controller board that would be used to control the Z-Height system**

**Notes:**

* The hypothetical controller board which runs your code may be anything from an Arduino, to a full Embedded PC -- just describe how the motor would connect to it.

**3) Once you have chosen your favorite Z-Height control system, write me a few functions that -- given what you know about the motor, and a hypothetical controller board of your choice -- cause your chosen motor to move the hypothetical build plate:**

**(A) up by a given height (in mm)**

**(B) and down, by a given height (in mm)**

**Notes:**

* Use any language you want
* Your code does not need to compile or run perfectly, but it should be conceptually sound. The more detailed the better, but it's okay if it stays general... as long as it addresses the main issue of controlling to the motor properly given your chosen controller board.
* If you can control the speed of movement, that is a major plus. Your up and down motor movements at given speeds. If the motor has an encoder, also write a function that allows you to get the current position of the motor.
* If you cannot complete this step, please give a detailed description of the direction you would take to finish it.
* ***Most importantly, Please describe any design decisions you find particularly relevant. This step is important -- we want to know how you think about problems.***

**Sound good? Sound hard? Ok!** **A few general notes to help you out:**

* If you can't finish a piece of the above, just provide a description of what you failed to deliver on, and why you think you weren't able to deliver on it-- whether time, knowledge, or bad design choices. It's important to us that you know where you need to improve. Also provide some ways you would approach it differently next time.
* Again, we want to focus on here not your particular knowledge -- save some basic things -- but rather your capacity to take what knowledge you have, expand that, and design a subsystem that works well.

**Bonus points --- not necessary at all.**

* Any extra functions for the motion system that you can implement from the detailed doc I sent you previously would be awesome.
* If the motor has an encoder -- write a function to get its current position!
* Source some limit switches, and include them in your design.

**Final Deliverables**

* A folder with documents containing anything described in the above project.

Have fun :)