# Progress report 2023-08-18

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# What I’ve been working on:

I met with you to discuss changes made to the experimentation for validating the model. In this meeting we confirmed:

I can validate the model without using camera position tracking, so long as I ensure that my experiments are objective and repeatable.

I could still do position if time allows, to add another objective measure of the model’s accuracy.

Measuring the coefficient of friction will not be necessary, I should just keep it constant.

Using a brushless motor is justified for gathering information about the system, even if it isn’t practical for cost reduction in a mass produced system.

# What I’m working on next:

Improving prototype: Will replace motor gearboxes with higher gear ratios for more torque.

Improve models: In order to validate the models, I need to confirm the parameters of my physical device. This means measuring masses so that the inertias in the model are accurate, and measuring the stalling torque of the motors at different voltages. I also want to update the models to be able to provide answers to questions 5 and 6, which I had not considered until I tested the physical device.

Model validation: I need to perform experiments to answer each of the listed questions, and compare this with the answers provided by the models.

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Unchanged:

Next iteration: While building and testing the device I have been considering potential improvements for a future version. If time allows, I would like to build a second device after I have validated the model using the first device. The design of this device would consider lessons learned from the model, and multiple concepts could be quickly tested in simulation. The ideas I’m currently pondering include using bearings, herringbone gears, brushless dc motors, and possibly even connecting the two LIMs together with a bolt so they move rigidly together, eliminating the possibility that one moves ahead of the other.