Progress report 2023-09-21

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What I've been working on:

I have recorded the current throughout the climbing motion on an oscilloscope as suggested. I can compare this recording with the discrete time outputs of the simulation and model. For this purpose, I have set up the simulation to output a log of the torque while it runs.

I have continued writing up the maths model in my report. When writing the report I realised some common sense changes I could make so that it is more straightforward to explain. In doing so I found a mistake in my previous equations which I have now resolved. I also found that some hacks I had made earlier to the solver were incompatible with my changes. I have now updated the solver to allow one to use inequalities to specify quadrants, which is a lot more robust than my previous solution.

When doing my analysis on the recorded data, I found that I am missing some datapoints and will have to do a few more experiments.

What I'm working on next:

Model validation: I will perform additional experiments and further analysis on the experimental data obtained so that I can make conclusions about the accuracy of the simulation and math model. I will build new LIMs with a different gear ratio to validate that the model can describe the motion with different gear ratios, however this may only happen after the draft submission.

Writing report: I will continue writing up sections of the report so as to be ready for the draft submission.