1. **Our tendon data:**

* *OurTendon-LSTM-0baselineForTrain-Non0Test0.3Hz.jpg*: use zero baseline data (0.3, 0.4Hz) for LSTM training and Non-zero baseline (0.3Hz) for prediction.
* *OurTendon-LSTM-Non0baselineForTrain-0Test0.3Hz.jpg*: use Non-zero baseline data (0.1, 0.2, 0.3, 0.4, 0.5Hz) for LSTM training and zero baseline (0.3Hz) for prediction.

1. **Data from Yash:**

* *tendon\_tension-tip\_disp\_allfreq.jpg*: tip displacement vs. tendon tension of all zero baseline data (0.1, 0.2, 0.15, 0.3Hz).
* *tendon\_disp-tip\_disp\_allfreq.jpg*: tip displacement vs. tendon displacement of all zero baseline data (0.1, 0.2, 0.15, 0.3Hz).
* *LSTM prediction & Ground Truth (0.15Hz).jpg*: use zero baseline (0.1, 0.2, 0.3Hz) for LSTM training and zero baseline (0.15Hz) for prediction.
* *20230930/Non-zero baseline for training.jpg*: use non-zero baseline (0.15Hz) for LSTM training and zero baseline (0.15Hz) for prediction. There is only one good non-zero baseline trail.
* *20230930/Zero baseline for training.jpg*: use zero baseline (0.1, 0.2, 0.3Hz) for LSTM training and non-zero baseline (0.15Hz) for prediction.
* *LSTM/Tendon-LSTM-Non0baselineForTrain-TestRandom.jpg*: use non-zero baseline (0.15Hz) for training and random data for prediction.
* *LSTM/Tendon-LSTM-0baselineForTrain-TestRandom.jpg*: use zero baseline (0.1, 0.2, 0.3Hz) for training and random data for prediction.
* *LSTM/Tendon-LSTM-Non0baselineForTrain-0Test0.15Hz.jpg*: use non-zero baseline (0.15Hz) for training and zero baseline (0.15Hz) for prediction.
* *LSTM/Tendon-LSTM-0baselineForTrain-Non0Test0.02Hz.jpg*: use zero baseline (0.1, 0.2, 0.3Hz) for training and non-zero baseline (0.02Hz) for prediction.
* *random motion/Tip\_displacement\_vs\_time\_random\_input.jpg*: random motion tip displacement vs. time.
* *random motion/3D tip position-random input data-1.jpeg*: 3D plot of tip position
* *random motion/3D tip position-random input data-2.jpeg*: 3D plot of tip position (different view)
* *random motion/Tip\_displacement\_vs\_time\_random&LSTM1.jpg*: random motion simulated and actual tip displacement vs. time; LSTM model is trained using zero baseline data (0.1, 0.2, 0.3Hz).
* *random motion/Tip\_displacement\_vs\_time\_random&LSTM2.jpg*: random motion simulated and actual tip displacement vs. time; LSTM model is trained using non-zero baseline data (0.15Hz).

1. **CTR data:**

Three tube CTR - Six variables:

"α1" - outermost tube rotation "β1" - outermost tube translation

"α2" - middle tube rotation "β2" - middle tube translation

"α3" -innermost tube rotation "β3" - innermost tube translation

All the plots bellow are tip displacement predictions of LSTM model using CTR dataset for training.

* *CTR\_data\_hysteresis\_test1.jpg*: "α1" is descending sinusoidal signal and the other five were fixed.
* *CTR\_data\_hysteresis\_test2.jpg*: "β1" is descending sinusoidal signal and the other five were fixed.
* *CTR\_data\_hysteresis\_test3.jpg*: "α2" is descending sinusoidal signal and the other five were fixed.
* *CTR\_data\_hysteresis\_test4.jpg*: "β2" is descending sinusoidal signal and the other five were fixed.
* *CTR\_data\_hysteresis\_test5.jpg*: "α3" is descending sinusoidal signal and the other five were fixed.
* *CTR\_data\_hysteresis\_test6.jpg*: "β3" is descending sinusoidal signal and the other five were fixed.
* *CTR\_data\_hysteresis\_test\_all.jpg*: put all six plots above together

Plots of the training data:

The dataset has been collected in eight sequences. Each sequence encompasses 12,500 points. Eight sequences are similar.

* Plot 1: 3D plot of tip position versus time:
* *CTR\_data\_tip\_position\_seqlen100.jpg*: the first 100 tip position of sequence 1.
* *CTR\_data\_tip\_position\_seqlen12500.jpg*: all 12,500 tip positions of sequence 1.
* Plot 2: 6 input variables versus time:
* *CTR\_data\_sixVariables\_seqlen100.jpg*: the first 100 points of sequence 1.
* *CTR\_data\_sixVariables\_seqlen12500.jpg*: all the 12,500 points of sequence 1.