

## Deep Learning Final Project Check In #3

### **Introduction:**

We have picked a research paper that uses wavelet-based multiscale deep learning algorithms for arctic sea ice melting prediction. It uses a 1D model with LSTM and a 2D CNN-LSTM model to produce two sets of results on predicted sea ice surface area. Following this paper, we are planning to attempt both models.

### **Challenges:**

The hardest part of the project that we have encountered so far has been finding a pre-processing the data into a usable format. For one, there are many hoops to go through to secure the data in the first place, such as submitting a request to download the data and not being able to push datasets of a large size to GitHub. After we had secured the data, we ran into an issue of the sparsity of the data that we needed to augment with other sources. For our 1D LSTM, in particular, we ended up needing to compile data from many different sources to ensure more reliable results. We ran into a few challenges when pre-processing the data to make sure that the data that came in different formats could all be parsed the same way. All in all, finding and working with datasets has been the most challenging part of our project so far.

### **Insights:**

We have successfully completed our 1D LSTM model! We have a graph of our prediction model compared to the actual data, and our mean absolute error is 0.08 after 140 epochs. We have also successfully preprocessed our data for both our LSTM and CNN-LSTM models, including performing discrete wave transformations on the data for the latter form. We hope to start training and by the end of this weekend so that our CNN will also be complete and we are finished with our project.

**Plan:**

We are on track with our project! Having successfully preprocessed the data for both of our models, we are ready to simply recreate the architectures that we described in the paper we are following, then train and test our model. Since we will be using a lot of existing libraries, the only time-consuming part may be hyperparameter tuning due to limited compute. After training and testing our model, we will dedicate most of our time to making our poster and documenting our results. As of right now, there is nothing that we are planning to change about our initial plan!