CLASSIFICATORY MODEL FOR MOTOR NEURONAL SIGNALS.
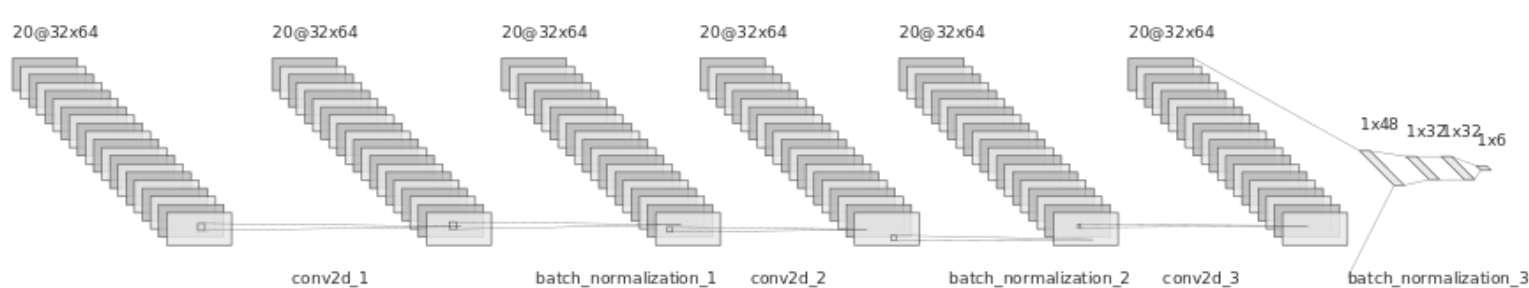
*LUIS ALEJANDRO HIGUARÁN
DAVE SEBASTIAN VALENCIA
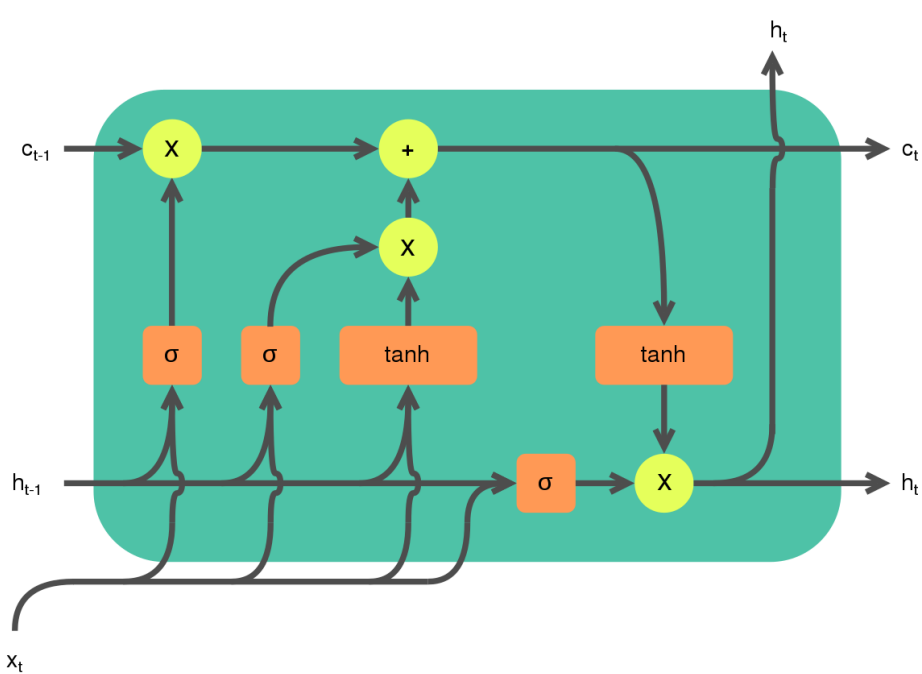DIEGO ALEJANDRO GARCÍA*

CNN VS. LSTM.

Comparing 2 models to predict motor movements based on EEG signals.

It was found that more complex models like LSTM networks are better suited for these tasks rather than standard CNNs.

CNN MODEL

LSTM MODEL

RESULTS

- ### CNN MODEL
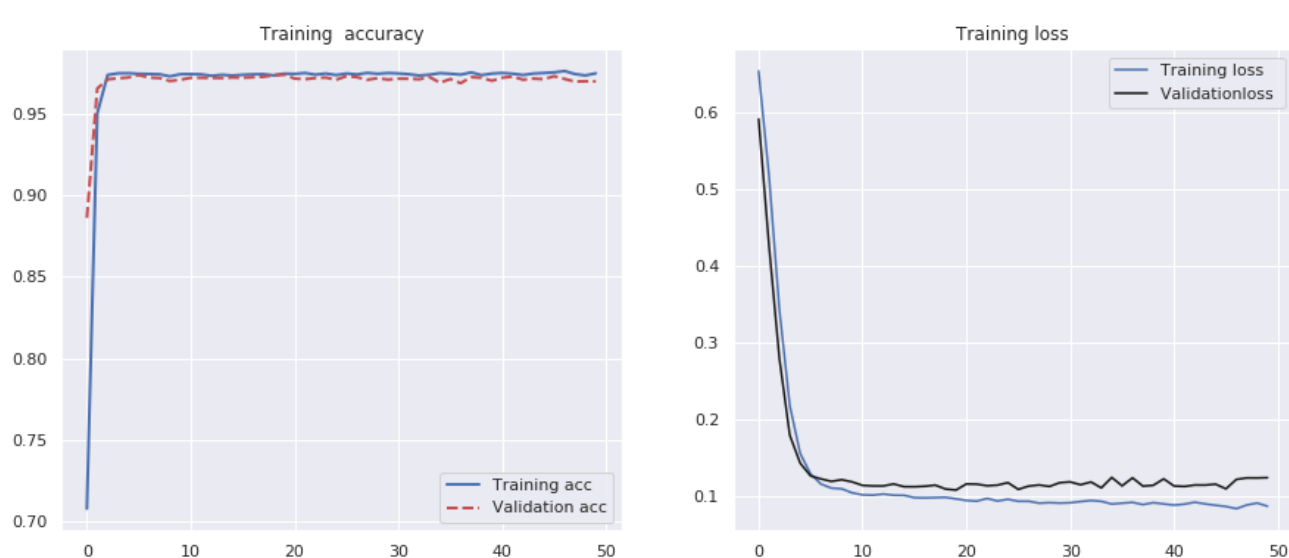

- ### LSTM MODEL

PROBLEM STATEMENT

The goal is to predict when a hand is performing each of six different actions given electroencephalography (EEG) signals. The EEG signals are obtained from sensors placed on a subject's head, and the subject is then instructed to perform each of the six actions in sequence: HandStart, FirstDigitTouch, BothStartLoadPhase, LiftOff, Replace, BothReleased.
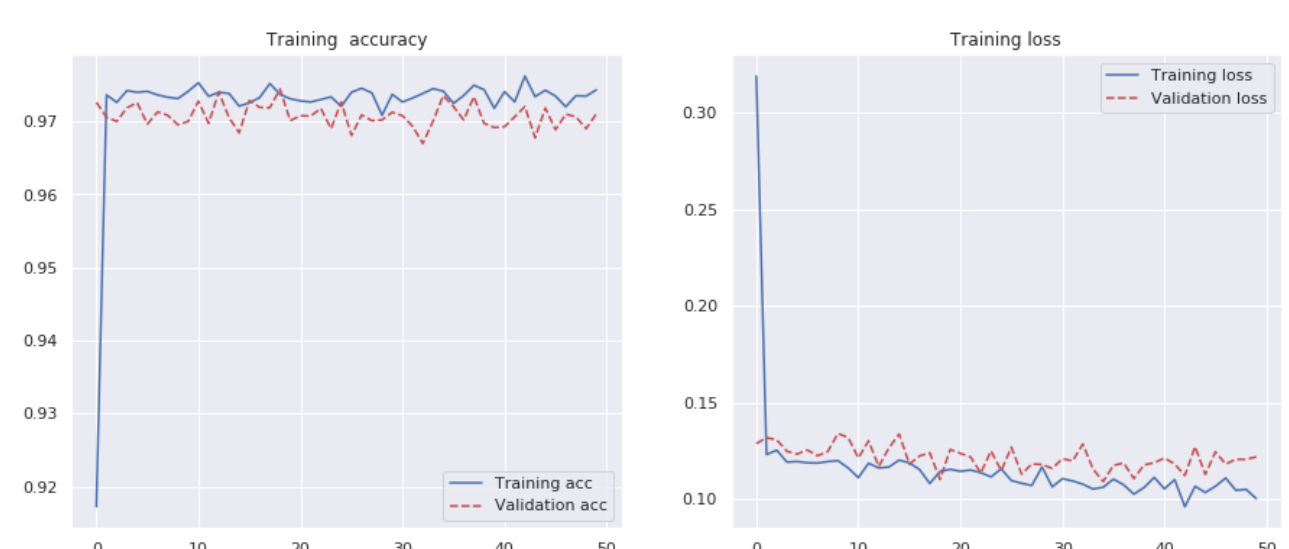
DATA DESCRIPTION

This data contains EEG recordings of subjects performing grasp-and-lift (GAL) trials. There are 12 subjects in total, 10 series of trials for each subject, and approximately 30 trials within each series. The number of trials varies for each series. The training set contains the first 8 series for each subject. The test set contains the 9th and 10th series.
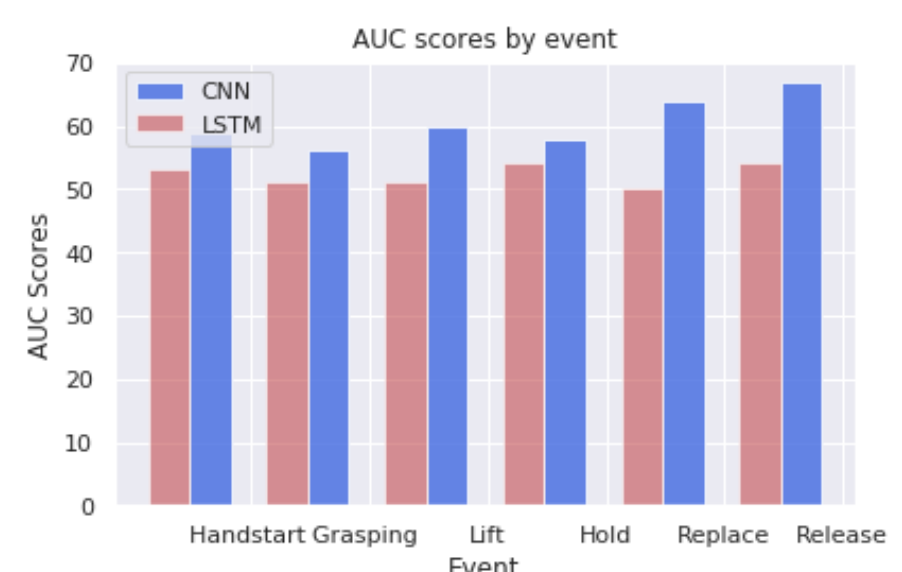
CONCLUSION

Robust features, advanced machine learning methods, and algorithms capable of modeling highly non-linear relationships were crucial to achieving maximum performance. The score was gradually increased when switching from the CNN model to the LSTM model, at the cost of greater solution complexity and calculation time, without the risk of overfitting due to the amount of data and stability over time.

VIDEO: *https://youtu.be/fgFVp9GbQsA*