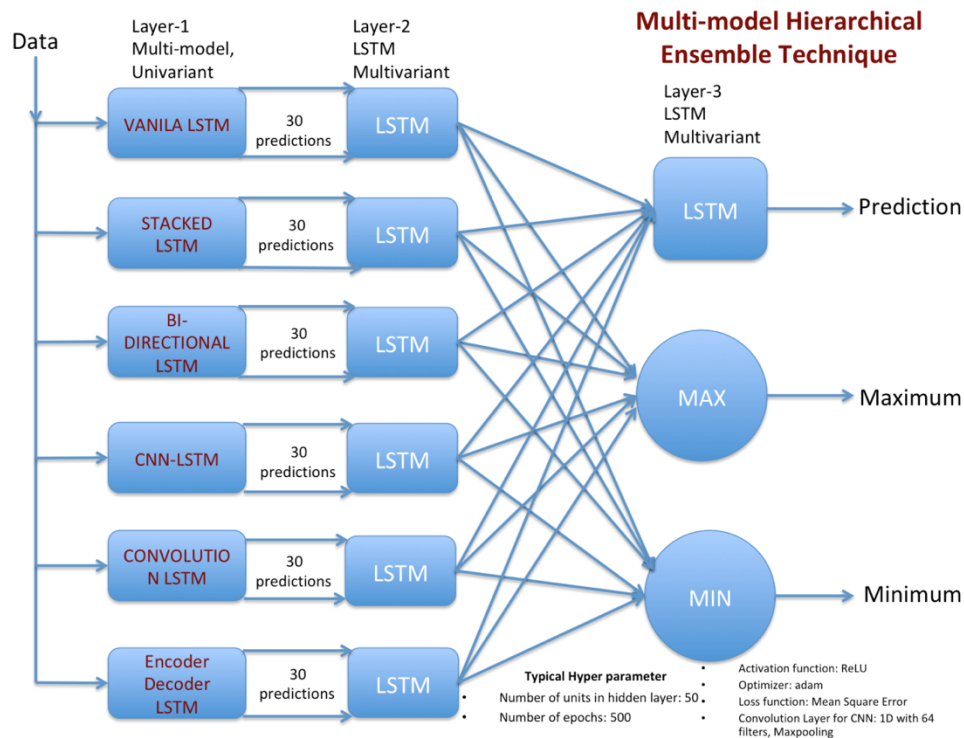


## CSIR Fourth Paradigm Institute Bangalore- 560037

Deep learning framework based on LSTM (Long Short Term Memory) used at CSIR4PI to provide the prediction is depicted below, which is self explanatory



**Figure-1: Ensemble Deep Learning Framework for COVID19 Prediction**

The parameter used for the prediction purpose is the percentage increase in positive cases, give using below equation is as the prediction parameter

$$100X \frac{\text{Number of positives on } n^{\text{th}} \text{ day}}{\text{Total number of positive cases till } (n-1)^{\text{th}} \text{ day}}$$

### Data considerations and assumptions for long-term prediction (about 80 days) for Indian states

- The data used upto 31<sup>st</sup> October 2021 is collected from <https://www.covid19india.org>,
- Rest of the data is collected through web scraping of various website such as state government bulletins, <https://prsindia.org/covid-19/cases>, <https://www.mygov.in/covid-19> etc.
- Though the predictions are done for a long term, they are updated on a weekly basis.
- Each week the models are re-trained using the newly available data (additional 7 days each week).
- The predictions are purely based on the observed data and hence, are not expected to exactly predict the numbers. However, these can pick the trends and hence will be an essential input for supply chain management and logistic planning.

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