

Assignment 3 - Time-Series Data
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The goal of this project was to predict air temperature 24 hours ahead. The following models were tested: simple baseline, LSTM, GRU, and a hybrid mode. Each model was compared using MAE to determine which one made the most accurate predictions.

The baseline model guessed that the temperature 24 hours later would be the same as it is now. It had an average error of about 2.44 degrees Celsius. All of the deep learning models made more accurate predictions than this. The GRU model did a little better than the LSTM, and the hybrid Conv1D plus GRU model gave the best results overall.

Model	Validation MAE (Celsius)
Baseline	2.44
LSTM	2.36
GRU	2.31
Hybrid	2.27

The results show that the RNN models did better than the simple baseline when predicting temperature. Both the LSTM and GRU models were able to recognize patterns that change over time, and the GRU performed a little better than the LSTM. Adding a convolutional layer in the hybrid model helped it pick up short-term changes that happen within each day. Overall, the hybrid Conv1D plus GRU model had the lowest error, showing that combining convolution and recurrence made it the most accurate for this forecasting task.