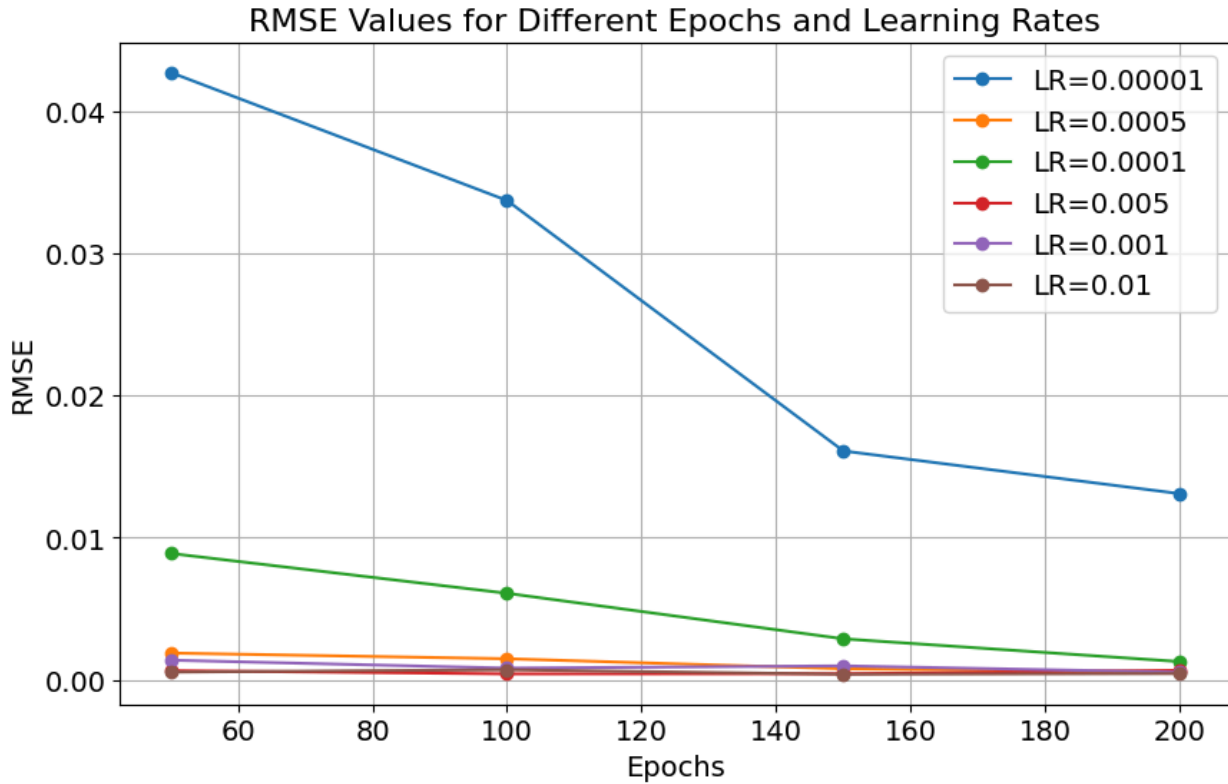# Root Mean Squared Errors in predicting traffic for different hypermeter values in training the LSTM model. The error reported is for the time series forecast of traffic 2 hours into the future.

RMSE Values for Different Epochs and Learning Rates

RMSE vs Epochs plot with legend: LR=0.00001, LR=0.0005, LR=0.0001, LR=0.005, LR=0.001, LR=0.01

Description of traffic time series data used to train the LSTM and ARIMA models

Variable Name	Type	Size	Description
tra_X_te	array of matrices	1*840	test set input data: traffic indices for 840 contiguous quarter-hours 36 spatial locations by 48 features
tra_X_tr	array of matrices	1*1261	training set input data: traffic indices for 1261 contiouous quarter-hours each element is a 36*48 matrix: 36 spatial locations by 48 features
tra_Y_te	array of matrices	36*840	● test set output data: traffic flowfor 36 locations in 840 contiguous quarter-hours from 2017-01-02 00:00
tra_Y_tr	array of matrices	36*1261	● training set output data: traffic flowfor 36 locations in 1261 contiouous quarter-hours until 2017-02-01 00:15
tra_adj_mat	squared matrix	36*36	adjacency matrix denoting the spatial connectivity of traffic network among 36 locations

| Variable Name	Type	Size	Description
tra_X_te	array of matrices	1*840	test set input data: traffic indices for 840 contiguous quarter-hours each element is a 36*48 matrix: 36 spatial locations by 48 features

MAP50 values for all the different learning rates for our YOLOv8 model. The higher the MAP50 values, the more accurate the object detection
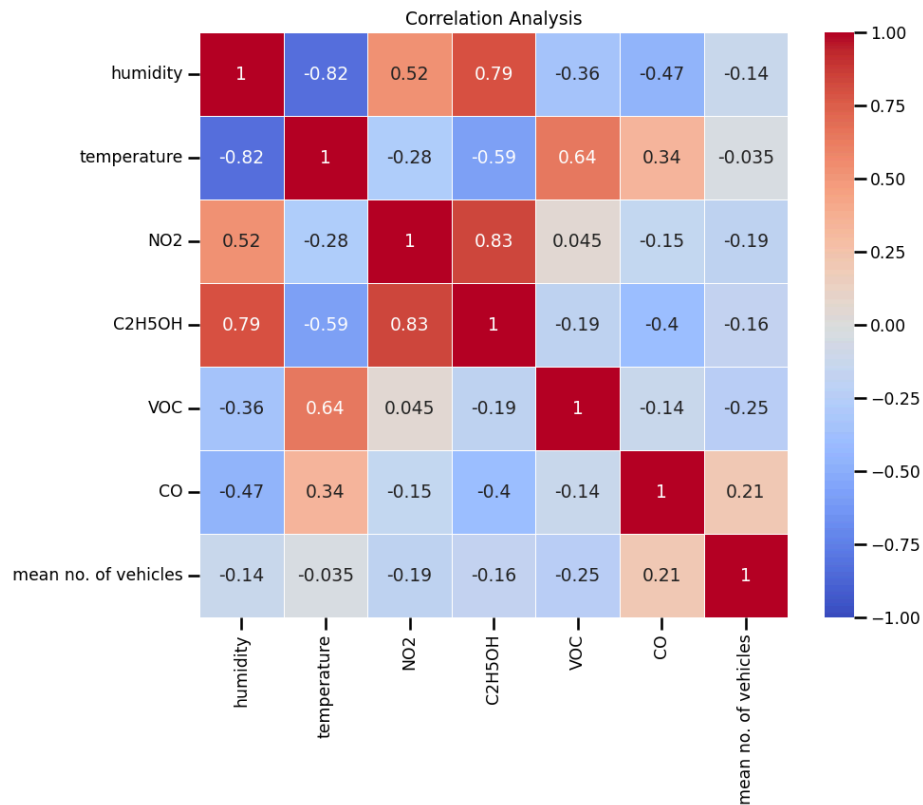
MAP@0.5 for YOLOv8 Model Across Learning Rates
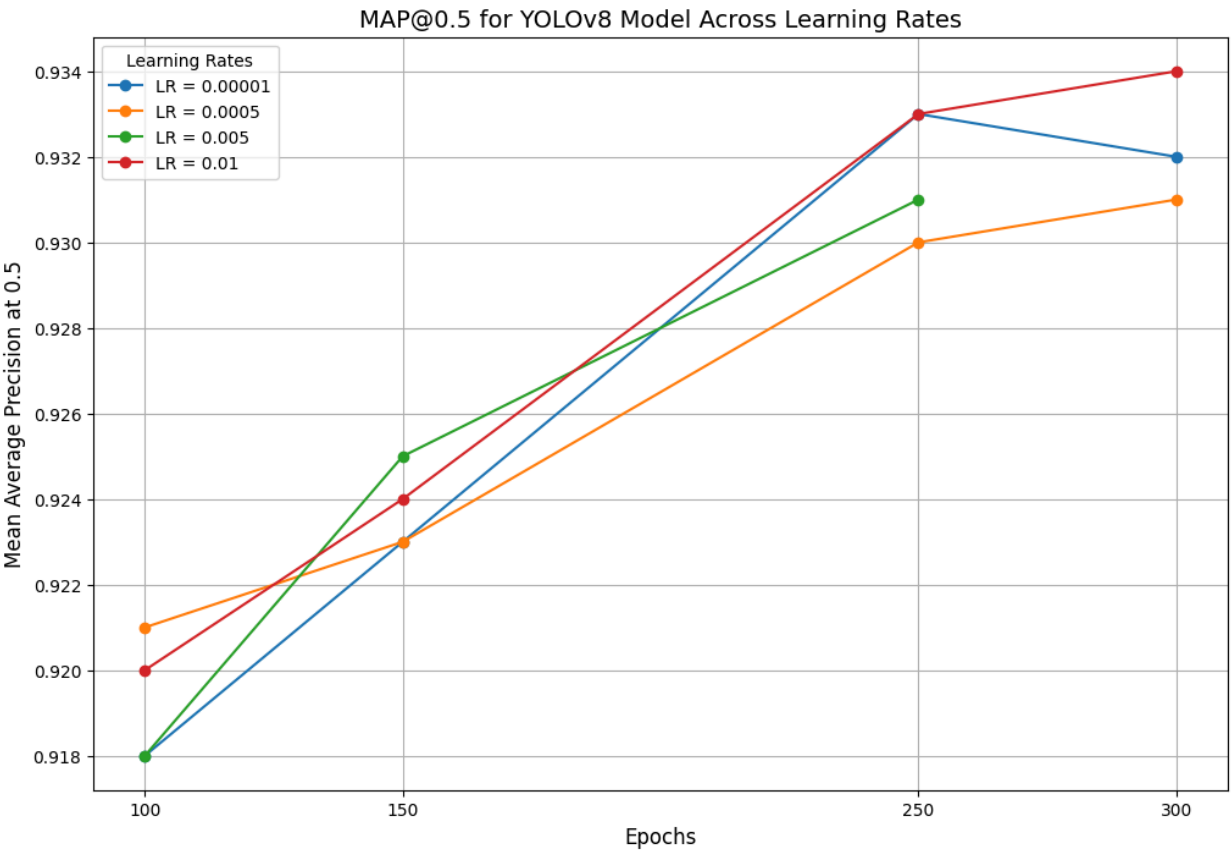
Confusion Matrix for air pollution elements to test the correlation between two elements in the atmosphere.

Correlation Analysis
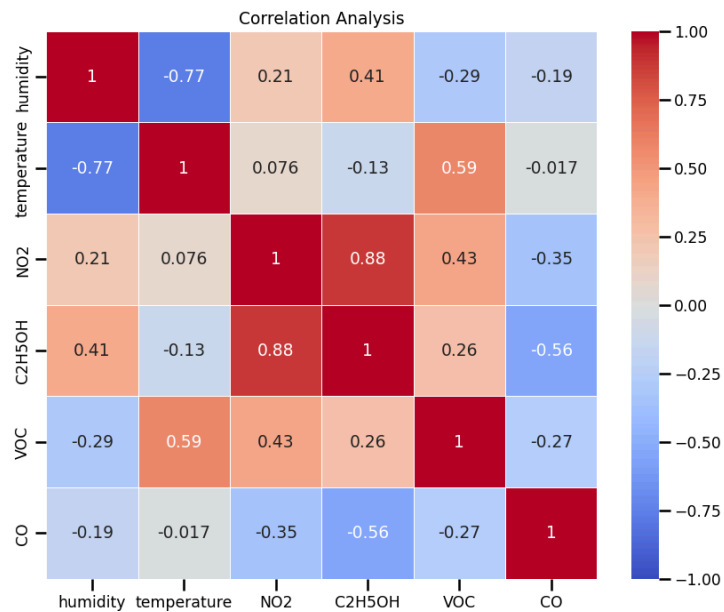
Time Series Analysis of air pollution at different times of the day in the LSTM model

Time Series Plot of Various Columns
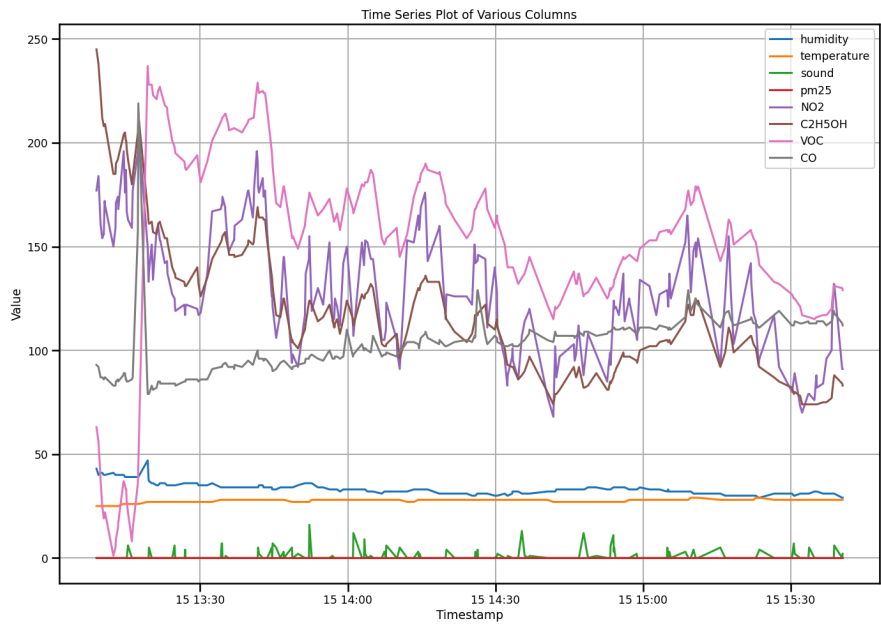
Confusion Matrix for air pollution elements against traffic count to visualise the correlation between traffic and air pollution

Correlation Analysis

	humidity	temperature	NO2	C2H5OH	VOC	CO	mean no. of vehicles
humidity	1	-0.82	0.52	0.79	-0.36	-0.47	-0.14
temperature	-0.82	1	-0.28	-0.59	0.64	0.34	-0.035
NO2	0.52	-0.28	1	0.83	0.045	-0.15	-0.19
C2H5OH	0.79	-0.59	0.83	1	-0.19	-0.4	-0.16
VOC	-0.36	0.64	0.045	-0.19	1	-0.14	-0.25
CO	-0.47	0.34	-0.15	-0.4	-0.14	1	0.21
mean no. of vehicles	-0.14	-0.035	-0.19	-0.16	-0.25	0.21	1

YOLOv8 Object Detection counting vehicles from our camera images, and forecasting traffic with a confidence rating.

Image of the sensor that we built that measures 6 elements of the conditions of the atmosphere