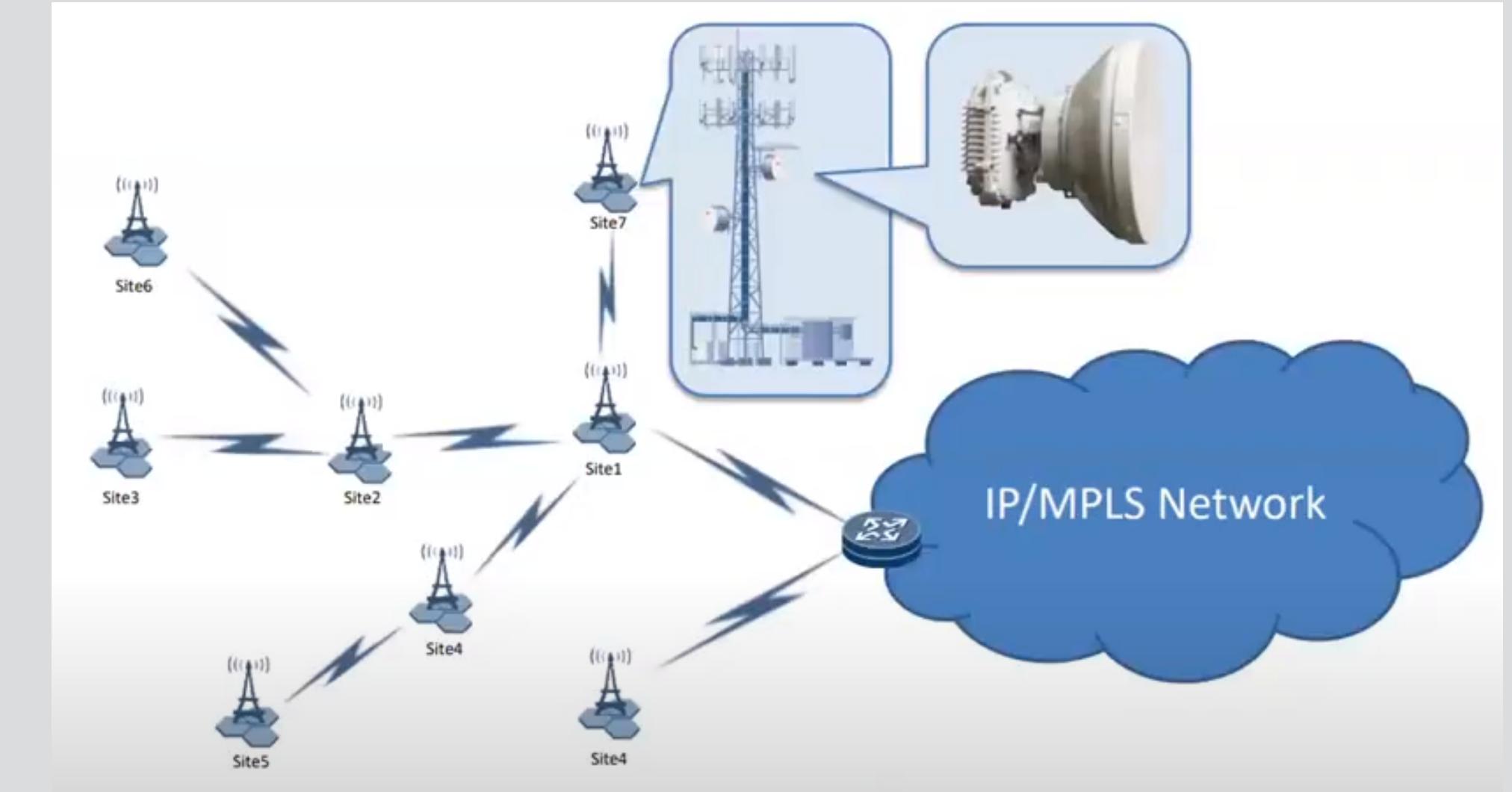


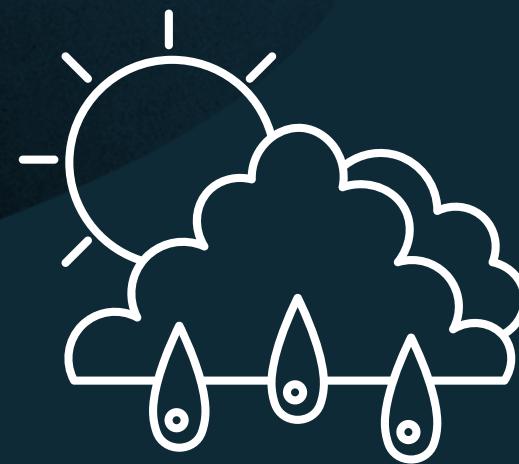
Radio Link Failure Prediction Challenge

02/12/22

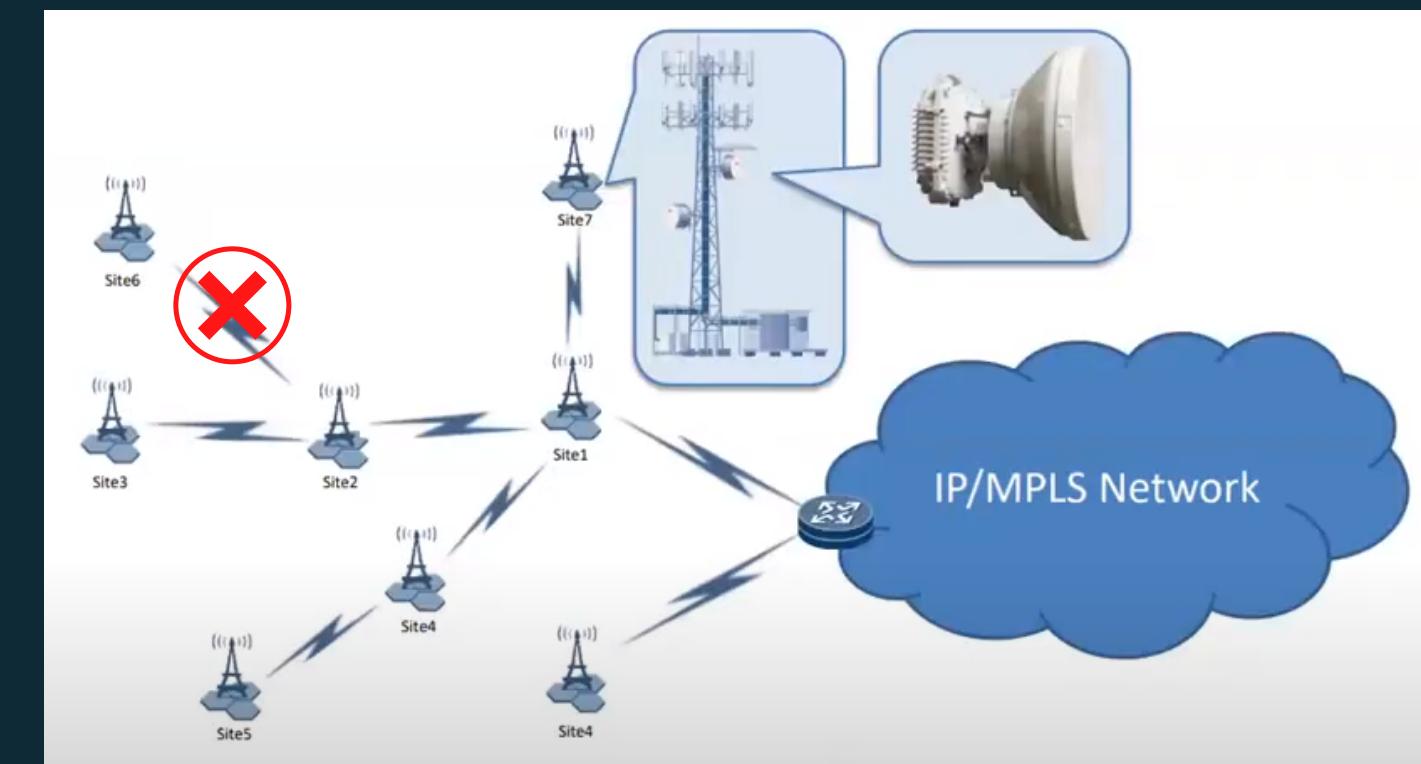
Radio Links



Radio Link Failure



Weather-Related Phenomena



Radio Link Failure

Is it possible to predict radio link failures
in the next day? the following 5 days?

The Data (by Turkcell)

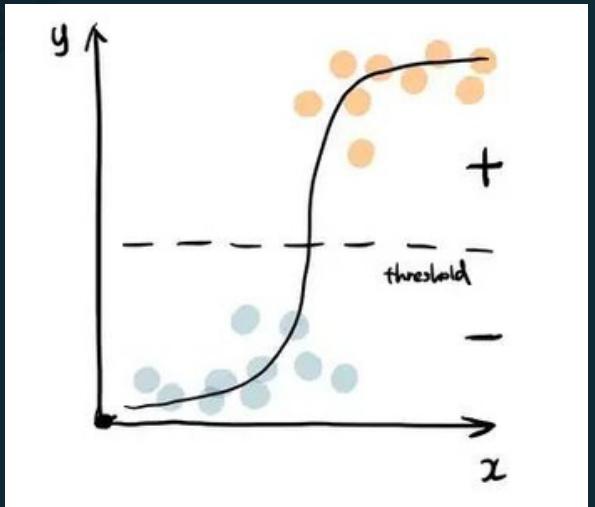
Weather Forecast

Radio Link KPIs

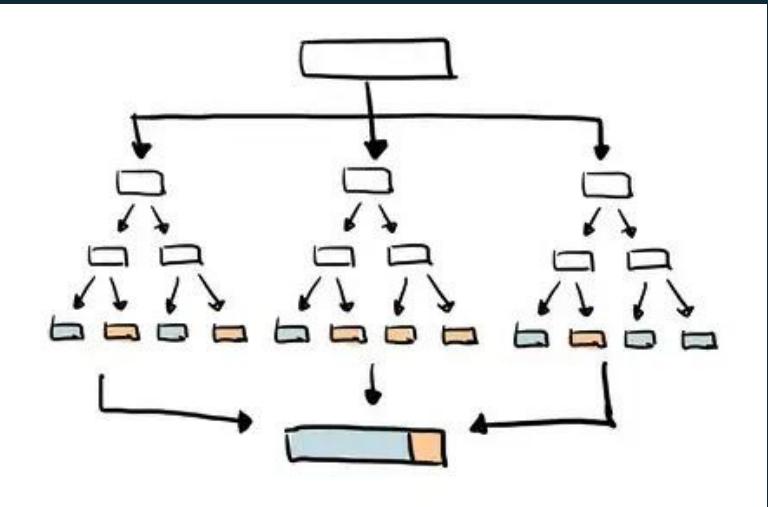
Distances

Radio Link Sites

Background



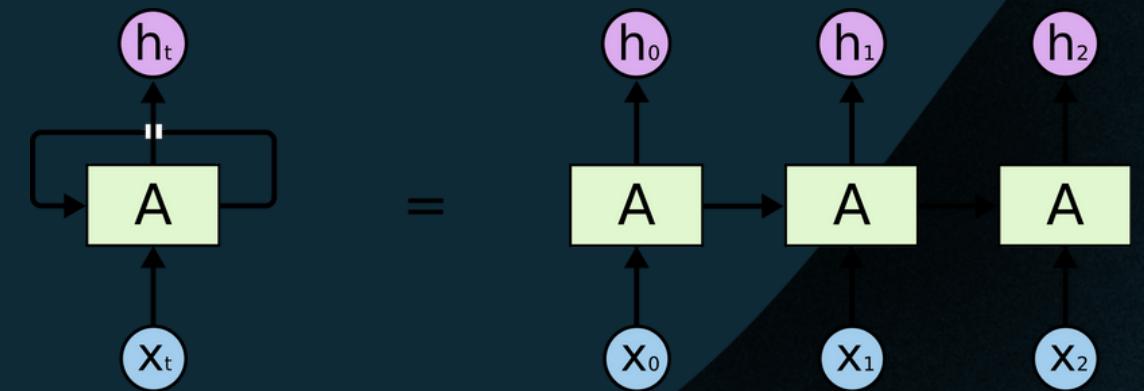
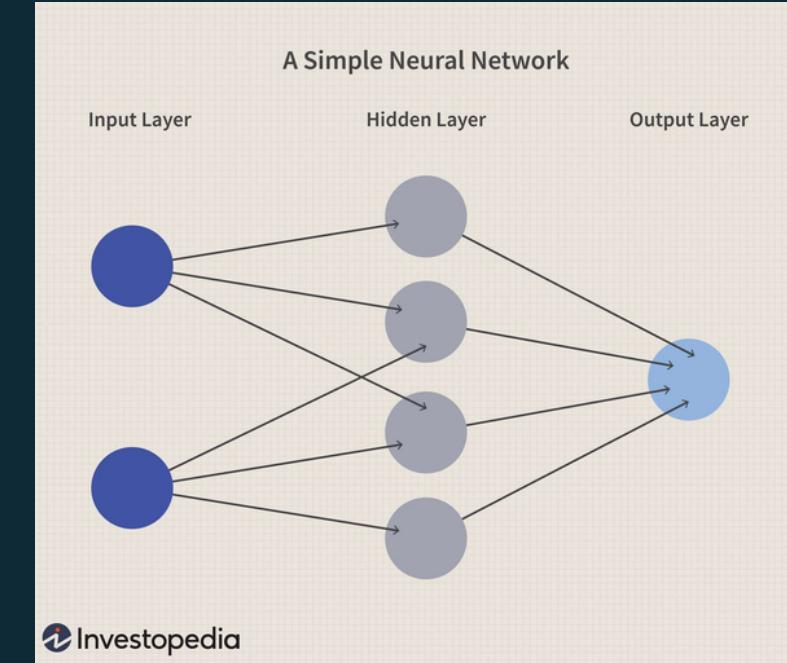
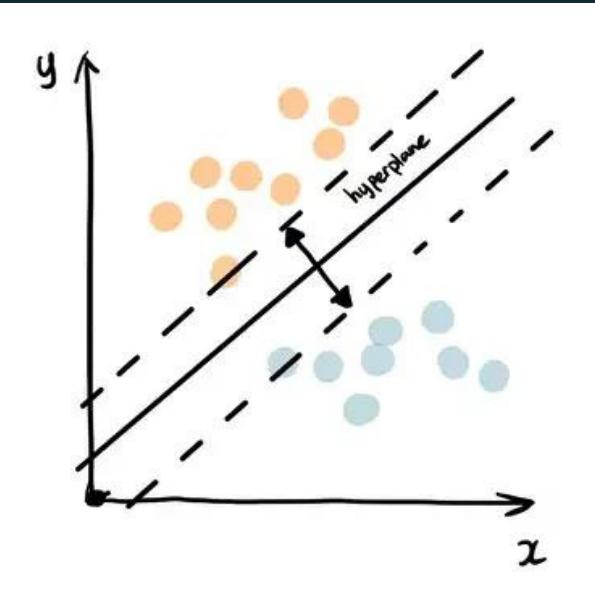
Logistic Regression



Random Forest

LGBoost

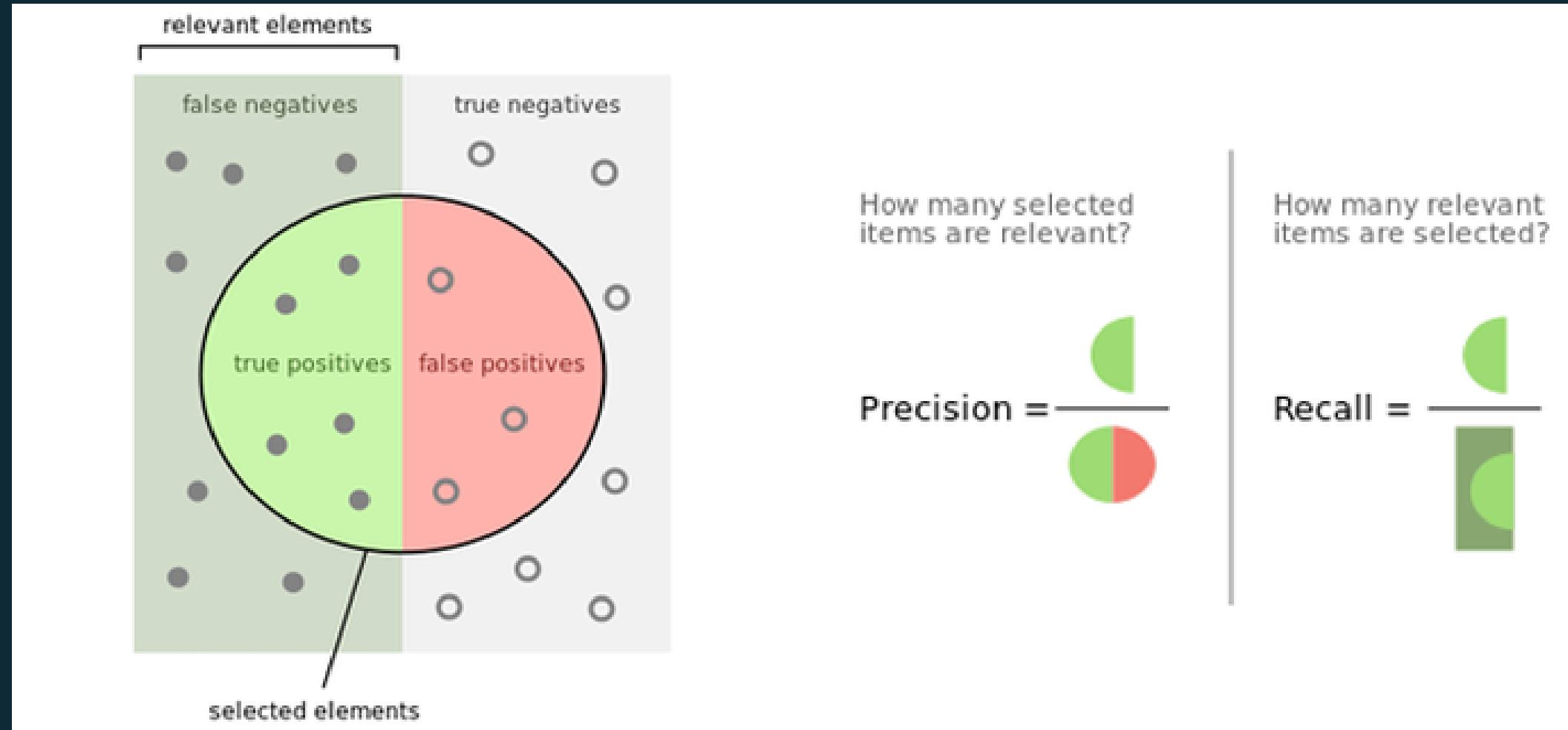
XGBoost



LSTM

Support Vector Machine

Background (Continued)



F1-Score: Harmonic Mean of Precision and Recall.

Background (Continued)

Results from Aktaş et al. (2022):
(Prediction made using 10 days of data)

Model	F1-Score
LR	0.105
SVM	0.455
LSTM	0.601
LSTM+	0.638

Results from Kotagiri et al. (2020):
(Prediction made using 1 day of data)

Model	F1-Score
RF-XGBoost-LGBoost	0.78

Approach

Data Processing

Radio Link Sites + Weather
Data

Skewed data set
=> take subset of dataset

Learning Techniques

XGBoost

LSTM

Dense Neural Network

Results

Method	XGBoost	LSTM	Dense-1	Dense-2
F1-Score 1-Day Prediction	0.64	0.44	0.42	0.33
F1-Score 5-Day Prediction	0.82	0.67	0.64	0.7

Future Directions

- More advanced data processing
- Different neural network architectures
- Combined methods as Kotagiri et al. (2020)

References

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