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Identifying pollution sources and predicting urban air quality using ensemble learning methods

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HIGHLIGHTS

- Developed tree ensemble models for seasonal discrimination and air quality prediction.
- PCA used to identify air pollution sources; air quality indices used for health risk.
- Bagging and boosting algorithms enhanced predictive ability of ensemble models.
- Ensemble classification and regression models performed better than SVMs.
- Proposed models can be used as tools for air quality prediction and management.

GRAPHICAL ABSTRACT

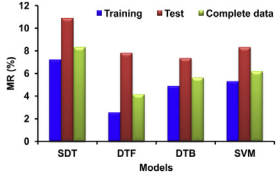
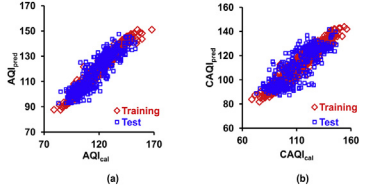


Figure shows misclassification rate in seasonal discrimination of air quality of Lucknow yielded by different models and suggest that the ensemble learning classification models (DTF and DTB) performed relatively better than SDT and SVM.



Figures show correlative distribution of calculated and model predicted values of (a) AQI, and (b) CAQI for Lucknow ambient air using DTB model.