

Data
(pre-process)
quality check

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graph LR; A["Data (pre-process) quality check"] --> B["Perform DE Analyses (1) normal vs. COVID-19 (2) mild vs. severe; Identify Top Features among the 2 pairwise comparisons"]; B --> C["Build ML Models for 2 binary classification using the top features (Random Forest & SVM); (1) normal vs. COVID-19 (2) mild vs. severe; Perform 5-Fold Cross Validation; Train Test Set 3:1 Split"]; C --> D["Performance Evaluation: Accuracy, F1 score, AUC-ROC; Pathway Analysis using the top 15 features"];
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Perform DE Analyses
(1) normal vs. COVID-19
(2) mild vs. severe

Identify Top Features
among the 2 pairwise
comparisons

Build ML Models
for 2 binary classification
using the top features
(Random Forest & SVM)

(1) normal vs. COVID-19
(2) mild vs. severe

**Perform 5-Fold Cross
Validation**

Train Test Set 3:1 Split

Performance Evaluation

- Accuracy
- F1 score
- AUC-ROC

Pathway Analysis
using the top 15 features