

**Data**  
(pre-process)  
quality check

**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  
(RF & 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