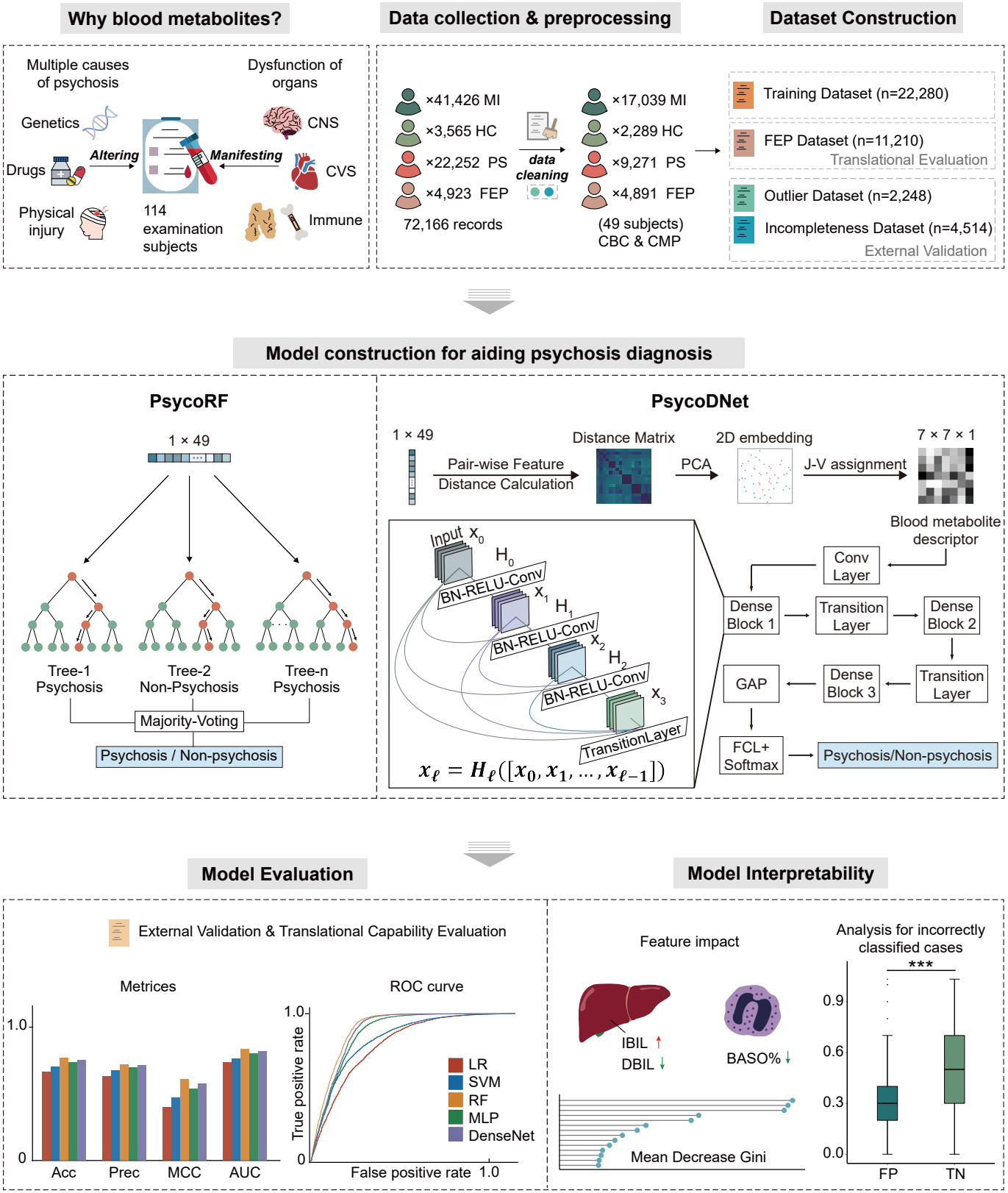
Why blood metabolites?
Multiple causes of psychosis
Dysfunction of organs
Genetics
CNS
Drugs
Altering
Manifesting
CVS
Physical injury
114 examination subjects
Immune
Data collection & preprocessing
×41,426 MI
×3,565 HC
×22,252 PS
×4,923 FEP
72,166 records
data cleaning
×17,039 MI
×2,289 HC
×9,271 PS
×4,891 FEP
(49 subjects) CBC & CMP
Dataset Construction
Training Dataset (n=22,280)
FEP Dataset (n=11,210)
Translational Evaluation
Outlier Dataset (n=2,248)
Incompleteness Dataset (n=4,514)
External Validation
Model construction for aiding psychosis diagnosis
PsycoRF
1 × 49
Tree-1 Psychosis
Tree-2 Non-Psychosis
Tree-n Psychosis
Majority-Voting
Psychosis / Non-psychosis
PsycoDNet
1 × 49
Pair-wise Feature Distance Calculation
Distance Matrix
PCA
2D embedding
J-V assignment
7 × 7 × 1
Blood metabolite descriptor
Input x0
H0
BN-RELU-Conv
x1
H1
BN-RELU-Conv
x2
H2
BN-RELU-Conv
x3
TransitionLayer
$x_\ell = H_\ell([x_0, x_1, \ldots, x_{\ell-1}])$
Conv Layer
Dense Block 1
Transition Layer
Dense Block 2
Transition Layer
Dense Block 3
GAP
FCL+ Softmax
Psychosis/Non-psychosis
Model Evaluation
External Validation & Translational Capability Evaluation
Metrices
1.0
0
Acc
Prec
MCC
AUC
ROC curve
True positive rate
False positive rate
LR
SVM
RF
MLP
DenseNet
Model Interpretability
Feature impact
IBIL
DBIL
BASO%
Mean Decrease Gini
Analysis for incorrectly classified cases
***
0.9
0.6
0.3
0.0
FP
TN