Data (Version 3)

TPM XGBoost (Cross-Validation)

Model	PNI 0.005	LVI 0.01
Training AUC	1.000000	1.000000
Evaluation AUC	0.782007	0.711158
Testing AUC	0.770139	0.626445
Training Precision	0.983871	1.000000
Testing Precision	0.746193	0.532710
Training Recall	1.000000	0.998384
Testing Recall	0.849711	0.431818

PNI 0.005

```
xgb1 = XGBClassifier(
        learning_rate = 0.01,
        n_estimators = 5000,
        max_depth = 7,
        min_child_weight = 3,
        gamma = 0.2,
        subsample = 0.8,
        colsample_bytree = 0.9,
        objective = 'binary:logistic',
        nthread = 4,
        scale_pos_weight = 1,
        seed = 27)
```

LVI 0.01

```
    xgb1 = XGBClassifier(
        learning_rate = 0.01,
        n_estimators = 5000,
        max_depth = 9,
        min_child_weight = 1,
        gamma = 0.3,
        subsample = 0.5,
        colsample_bytree = 0.6,
        objective = 'binary:logistic',
        nthread = 4,
        scale_pos_weight = 1,
        seed = 27)
```

Data (Version 2)

TPM Random Forest

Model	ROC AUC	Importance Threshold	# Features
PNI 0.001	0.7166400196777765	0.001135899211196161	167
PNI 0.005	0.7285696716271061	0.0007337340972927921	236
PNI 0.01	0.7095068257286926	0.0012108507166712443	81
PNI 0.05	0.7281392202681097	0.0020474173235228766	20
LVI 0.001	0.6113251155624037	0.0020496573458272	68
LVI 0.005	0.6116782229070366	0.0033019141262110867	3
LVI 0.01	0.6269581407293271	0.002685626598664987	4
LVI 0.05	0.621276322547509	0.0017521881111410068	3

TPM XGBoost

Model	Evaluation AUC	Test AUC
PNI 0.001	0.845499	0.702377972465582
PNI 0.005	0.858415	0.7317271589486859
PNI 0.01	0.83953	0.7124530663329162
PNI 0.05	0.841487	0.7220901126408009
LVI 0.001	0.70849	0.5775972217671919
LVI 0.005	0.75122	0.59653376142581
LVI 0.01	0.753612	0.6133407594273171
LVI 0.05	0.712852	0.6207122497788553

PNI 0.001

eta = 0.7
max_depth= 3
subsample = 1
colsample_bytree = 0.6
min_chil_weight=1

PNI 0.005

eta = 0.1
max_depth= 4
subsample = 0.6
colsample_bytree = 0.3
min_chil_weight=1

PNI 0.01

eta = 0.4
max_depth = 5

subsample = 0.6
colsample_bytree = 0.3
min_chil_weight=1

PNI 0.05
eta = 0.1
max_depth = 3
subsample = 0.8
colsample_bytree = 0.6
min_chil_weight= 1

LVI 0.001
eta = 0.5
max_depth = 9
subsample = 0.5
colsample_bytree = 0.6
min_chil_weight= 1

LVI 0.005
eta = 0.1
max_depth = 9
subsample = 0.5
colsample_bytree = 0.6
min_chil_weight= 1

LVI 0.01
eta = 0.1
max_depth = 9
subsample = 0.5
colsample_bytree = 0.6
min_chil_weight= 1

LVI 0.05
eta = 0.4
max_depth = 6
subsample = 1
colsample_bytree = 1
min_chil_weight= 1

Data (Version 1)

eXtreme Gradient Boosting (XGBoost)

Model	PNI	LVI

Feature Input Size	1167	720
Training Size	1064	1468
Testing Size	267	368
ROC AUC	0.839237	0.764423

PNI Parameters

eta = 0.1
max_depth= 5
subsample = 1
colsample_bytree = 0.2
min_chil_weight=1

LVI Parameters

eta = 0.5
max_depth= 1
subsample = 1
colsample_bytree = 0.6
min_chil_weight=1

Random Forest

Model	Input Size	# Features	Feature Importance	ROC AUC
PNI	606	28	0.00371	0.810
LVI	571	71	0.00266	0.701

Model	PNI	LVI
Feature Input Size	1167	720
Training Size	1064	1468
Testing Size	267	368
# Features	50	7
ROC AUC	0.8046980691181895	0.5915190035952748
Feature Importance	0.0025460256615451675	0.0045406823397902045