

Supplementary Tables

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Abbreviations

BLCA	Bladder Urothelial Carcinoma
BRCA	Breast invasive carcinoma
COAD	Colon adenocarcinoma
ESCA	Esophageal carcinoma
HNSC	Head and Neck squamous cell carcinoma
KIRC	Kidney renal clear cell carcinoma
KIRP	Kidney renal papillary cell carcinoma
LIHC	Liver hepatocellular carcinoma
LUAD	Lung adenocarcinoma
LUSC	Lung squamous cell carcinoma
PRAD	Prostate adenocarcinoma
THCA	Thyroid carcinoma
UCEC	Uterine Corpus Endometrial Carcinoma

S1 Metric tables for Logistic Regression models

S1.1 Binary

a. BLCA

	Normal	BLCA
Precision	1.0	1.0
Recall	1.0	1.0
F_1	1.0	1.0
Accuracy	1.0	
MCC	1.0	

b. BRCA

	Normal	BRCA
Precision	0.957	0.99
Recall	0.917	0.995
F_1	0.936	0.992
Accuracy	0.987	
MCC	0.929	

c. COAD

	Normal	COAD
Precision	1.0	1.0
Recall	1.0	1.0
F_1	1.0	1.0
Accuracy	1.0	
MCC	1.0	

d. ESCA

	Normal	ESCA
Precision	1.0	1.0
Recall	1.0	1.0
F_1	1.0	1.0
Accuracy	1.0	
MCC	1.0	

e. HNSC

	Normal	HNSC
Precision	1.0	0.992
Recall	0.923	1.0
F_1	0.96	0.996
Accuracy	0.993	
MCC	0.957	

f. KIRC

	Normal	KIRC
Precision	1.0	1.0
Recall	1.0	1.0
F_1	1.0	1.0
Accuracy	1.0	
MCC	1.0	

g. KIRP

	Normal	KIRP
Precision	0.917	1.0
Recall	1.0	0.986
F_1	0.957	0.993
Accuracy	0.988	
MCC	0.951	

h. LIHC

	Normal	LIHC
Precision	0.929	1.0
Recall	1.0	0.989
F_1	0.963	0.995
Accuracy	0.991	
MCC	0.959	

i. LUAD

	Normal	LUAD
Precision	0.889	1.0
Recall	1.0	0.992
F_1	0.941	0.996
Accuracy	0.992	
MCC	0.939	

j. LUSC

	Normal	LUSC
Precision	0.917	1.0
Recall	1.0	0.989
F_1	0.957	0.995
Accuracy	0.99	
MCC	0.952	

k. PRAD

	Normal	PRAD
Precision	1.0	0.992
Recall	0.923	1.0
F_1	0.96	0.996
Accuracy	0.993	
MCC	0.957	

m. UCEC

	Normal	UCEC
Precision	1.0	1.0
Recall	1.0	1.0
F_1	1.0	1.0
Accuracy	1.0	
MCC	1.0	

l. THCA

	Normal	THCA
Precision	0.737	1.0
Recall	1.0	0.961
F_1	0.848	0.98
Accuracy	0.965	
MCC	0.842	

S1.2 Multiclass

	Normal	BLCA	BRCA	COAD	ESCA	HNSC	KIRC	KIRP	LIHC	LUAD	LUSC	PRAD	THCA	UCEC
precision	0.953	0.99	0.98	0.988	0.956	0.949	0.975	0.957	1.0	0.983	0.977	0.954	0.992	1.0
recall	0.937	0.99	0.99	1.0	0.935	0.977	0.963	0.957	0.968	1.0	0.914	0.984	1.0	1.0
f1	0.945	0.99	0.985	0.994	0.945	0.963	0.969	0.957	0.984	0.992	0.944	0.969	0.996	1.0
accuracy	0.975													
mcc	0.973													

S2 Metrics tables for Support Vector Machine models**S2.1 Binary****a. BLCA**

	Normal	BLCA
Precision	1.0	1.0
Recall	1.0	1.0
F_1	1.0	1.0
Accuracy	1.0	
MCC	1.0	

c. COAD

	Normal	COAD
Precision	1.0	1.0
Recall	1.0	1.0
F_1	1.0	1.0
Accuracy	1.0	
MCC	1.0	

b. BRCA

	Normal	BRCA
Precision	0.957	0.99
Recall	0.917	0.995
F_1	0.936	0.992
Accuracy	0.987	
MCC	0.929	

d. ESCA

	Normal	ESCA
Precision	1.0	1.0
Recall	1.0	1.0
F_1	1.0	1.0
Accuracy	1.0	
MCC	1.0	

e. HNSC

	Normal	HNSC
Precision	1.0	0.992
Recall	0.923	1.0
F_1	0.96	0.996
Accuracy	0.993	
MCC	0.957	

f. KIRC

	Normal	KIRC
Precision	1.0	1.0
Recall	1.0	1.0
F_1	1.0	1.0
Accuracy	1.0	
MCC	1.0	

g. KIRP

	Normal	KIRP
Precision	1.0	1.0
Recall	1.0	1.0
F_1	1.0	1.0
Accuracy	1.0	
MCC	1.0	

h. LIHC

	Normal	LIHC
Precision	0.929	1.0
Recall	1.0	0.989
F_1	0.963	0.995
Accuracy	0.991	
MCC	0.959	

i. LUAD

	Normal	LUAD
Precision	0.889	1.0
Recall	1.0	0.992
F_1	0.941	0.996
Accuracy	0.992	
MCC	0.939	

j. LUSC

	Normal	LUSC
Precision	0.917	1.0
Recall	1.0	0.989
F_1	0.957	0.995
Accuracy	0.99	
MCC	0.952	

k. PRAD

	Normal	PRAD
Precision	1.0	0.992
Recall	0.923	1.0
F_1	0.96	0.996
Accuracy	0.993	
MCC	0.957	

l. THCA

	Normal	THCA
Precision	0.778	1.0
Recall	1.0	0.969
F_1	0.875	0.984
Accuracy	0.972	
MCC	0.868	

m. UCEC

	Normal	UCEC
Precision	1.0	1.0
Recall	1.0	1.0
F_1	1.0	1.0
Accuracy	1.0	
MCC	1.0	

S2.2 Multiclass

	Normal	BLCA	BRCA	COAD	ESCA	HNSC	KIRC	KIRP	LIHC	LUAD	LUSC	PRAD	THCA	UCEC
Precision	0.915	0.953	0.975	1.0	0.941	0.899	0.975	0.971	1.0	1.0	0.925	0.946	0.977	0.991
Recall	0.926	0.981	0.99	1.0	0.696	0.947	0.963	0.957	0.937	0.992	0.925	0.968	0.992	1.0
F_1	0.92	0.967	0.982	1.0	0.8	0.923	0.969	0.964	0.967	0.996	0.925	0.957	0.985	0.995
Accuracy							0.96							
MCC							0.956							

S3 Metric tables for XGBoost binary models

a. BLCA

	Normal	BLCA
Precision	1.0	0.981
Recall	0.6	1.0
F_1	0.75	0.99
Accuracy	0.982	
MCC	0.767	

b. BRCA

	Normal	BRCA
Precision	1.0	0.99
Recall	0.917	1.0
F_1	0.957	0.995
Accuracy	0.991	
MCC	0.953	

c. COAD

	Normal	COAD
Precision	1.0	1.0
Recall	1.0	1.0
F_1	1.0	1.0
Accuracy	1.0	
MCC	1.0	

d. ESCA

	Normal	ESCA
Precision	1.0	0.959
Recall	0.5	1.0
F_1	0.667	0.979
Accuracy	0.961	
MCC	0.693	

e. HNSC

	Normal	HNSC
Precision	0.923	1.0
Recall	1.0	0.992
F_1	0.96	0.996
Accuracy	0.993	
MCC	0.957	

f. KIRC

	Normal	KIRC
Precision	1.0	1.0
Recall	1.0	1.0
F_1	1.0	1.0
Accuracy	1.0	
MCC	1.0	

g. KIRP

	Normal	KIRP
Precision	0.833	0.986
Recall	0.909	0.971
F_1	0.87	0.978
Accuracy	0.963	
MCC	0.849	

h. LIHC

	Normal	LIHC
Precision	1.0	0.99
Recall	0.923	1.0
F_1	0.96	0.995
Accuracy	0.991	
MCC	0.956	

i. LUAD

	Normal	LUAD
Precision	1.0	1.0
Recall	1.0	1.0
F_1	1.0	1.0
Accuracy	1.0	
MCC	1.0	

j. LUSC

	Normal	LUSC
Precision	1.0	1.0
Recall	1.0	1.0
F_1	1.0	1.0
Accuracy	1.0	
MCC	1.0	

k. PRAD

	Normal	PRAD
Precision	0.75	0.992
Recall	0.923	0.968
F_1	0.828	0.98
Accuracy	0.964	
MCC	0.813	

l. THCA

	Normal	THCA
Precision	1.0	0.992
Recall	0.929	1.0
F_1	0.963	0.996
Accuracy	0.993	
MCC	0.96	

m. UCEC

	Normal	UCEC
Precision	1.0	1.0
Recall	1.0	1.0
F_1	1.0	1.0
Accuracy	1.0	
MCC	1.0	

S4 Metric table for neural network model on TCGA testset

	Normal	BLCA	BRCA	COAD	ESCA	HNSC	KIRC	KIRP	LIHC	LUAD	LUSC	PRAD	THCA	UCEC
Precision	0.958	0.99	0.98	0.988	0.978	0.963	0.963	0.957	1.0	1.0	1.0	0.947	0.985	1.0
Recall	0.92	0.99	0.98	1.0	0.978	0.992	0.963	0.971	0.979	1.0	0.957	0.984	1.0	1.0
F_1	0.939	0.99	0.98	0.994	0.978	0.978	0.963	0.964	0.989	1.0	0.978	0.965	0.992	1.0
Accuracy	0.978													
MCC	0.976													

S5 Metrics table for multiclass XGBoost on external data

	Normal	BRCA	COAD	ESCA	HNSC	KIRC	LIHC	PRAD	THCA
Precision	0.914	0.971	0.333	0.893	1.0	1.0	1.0	0.98	0.861
Recall	0.8	0.85	0.778	0.936	0.167	0.348	1.0	0.251	0.838
F_1	0.853	0.907	0.467	0.914	0.286	0.516	1.0	0.4	0.849
Accuracy	0.653								
MCC	0.645								