**Data1: gse10810**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Regularize** | **Classifier** | **Feature Num.** | **AUC** | **ACC** | **Sen.** | **Spe.** |
| Elastic net (alpha=0.5) | None | 133 | 0.9840.04 | 0.980.05 | 0.970.07 | 1.000.00 |
| KNN(k=5) | 6 | 1.000.00 | 1.000.00 | 1.000.00 | 1.000.00 |
| Random forest(100) | 8 | 1.000.00 | 1.000.00 | 1.000.00 | 1.000.00 |
| Naive bayse | 3 | 1.000.00 | 1.000.00 | 1.000.00 | 1.000.00 |
| Linear SVM | 6 | 0.990.01 | 0.990.02 | 0.990.03 | 1.000.00 |
| Rbf SVM | 3 | 0.870.07 | 0.870.07 | 0.950.06 | 0.800.13 |
| MCP | None | 1 | 0.940.06 | 0.930.06 | 0.920.09 | 0.960.08 |
| KNN(k=5) | 4 | 1.000.00 | 1.000.00 | 1.000.00 | 1.000.00 |
| Random forest(100) | 14 | 0.980.04 | 0.980.02 | 1.000.00 | 0.960.08 |
| Naïve bayse | 5 | 0.9980.007 | 0.9980.01 | 0.9970.01 | 1.000.00 |
| Linear SVM | 11 | 0.970.04 | 0.960.04 | 0.950.08 | 1.000.00 |
| Rbf SVM | 13 | 0.890.06 | 0.890.06 | 0.900.10 | 0.890.08 |
| SCAD | None | 13 | 0.970.04 | 0.970.05 | 0.950.07 | 1.000.00 |
| KNN(k=5) | 2 | 1.000.00 | 1.000.00 | 1.000.00 | 1.000.00 |
| Random forest(100) | 3 | 1.000.00 | 1.000.00 | 1.000.00 | 1.000.00 |
| Naïve bayse | 3 | 1.000.00 | 1.000.00 | 1.000.00 | 1.000.00 |
| Linear SVM | 8 | 1.000.00 | 1.000.00 | 1.000.00 | 1.000.00 |
| Rbf SVM | 4 | 1.000.00 | 1.000.00 | 1.000.00 | 1.000.00 |
| Adaptive lasso | None | 11 | 0.970.04 | 0.970.05 | 0.950.08 | 1.000.00 |
| KNN(k=5) | 7 | 1.000.00 | 1.000.00 | 1.000.00 | 1.000.00 |
| Random forest(100) | 6 | 1.000.00 | 1.000.00 | 1.000.00 | 1.000.00 |
| Naïve bayse | 3 | 1.000.00 | 1.000.00 | 1.000.00 | 1.000.00 |
| Linear SVM | 16 | 1.000.00 | 1.000.00 | 1.000.00 | 1.000.00 |
| Rbf SVM | 4 | 1.000.00 | 1.000.00 | 1.000.00 | 1.000.00 |

**Data2: gse15852**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Regularize** | **Classifier** | **Feature Num.** | **AUC** | **ACC** | **Sen.** | **Spe.** |
| Elastic net (alpha=0.5) | None | 50 | 0.890.06 | 0.890.06 | 0.900.08 | 0.880.08 |
| KNN(k=5) | 3 | 0.920.07 | 0.920.07 | 0.930.09 | 0.920.09 |
| Random forest(100) | 9 | 0.930.06 | 0.930.06 | 0.980.04 | 0.880.11 |
| Naïve bayse | 17 | 0.900.08 | 0.900.08 | 0.900.12 | 0.900.08 |
| Linear SVM | 9 | 0.880.07 | 0.880.07 | 0.890.10 | 0.870.10 |
| Rbf SVM | 19 | 0.960.05 | 0.960.05 | 0.980.04 | 0.940.04 |
| MCP | None | 5 | 0.830.09 | 0.830.09 | 0.810.15 | 0.850.13 |
| KNN(k=5) | 13 | 0.970.03 | 0.980.03 | 1.000.00 | 0.960.06 |
| Random forest(100) | 13 | 0.970.03 | 0.980.03 | 1.000.00 | 0.960.06 |
| Naïve bayse | 10 | 0.980.03 | 0.980.03 | 0.960.07 | 1.000.00 |
| Linear SVM | 9 | 0.950.04 | 0.950.04 | 0.940.06 | 0.960.06 |
| Rbf SVM | 11 | 0.950.04 | 0.950.04 | 0.950.08 | 0.950.07 |
| SCAD | None | 22 | 0.840.07 | 0.840.07 | 0.850.11 | 0.830.11 |
| KNN(k=5) | 14 | 0.940.03 | 0.970.03 | 1.000.00 | 0.940.06 |
| Random forest(100) | 12 | 0.970.03 | 0.970.03 | 1.000.00 | 0.930.07 |
| Naïve bayse | 18 | 0.990.02 | 0.990.02 | 0.980.05 | 0.990.01 |
| Linear SVM | 9 | 0.970.04 | 0.970.04 | 0.990.03 | 0.950.07 |
| Rbf SVM | 6 | 0.990.03 | 0.990.3 | 0.990.04 | 0.990.04 |
| Adaptive lasso | None | 22 | 0.870.07 | 0.870.07 | 0.870.12 | 0.860.12 |
| KNN(k=5) | 16 | 0.970.05 | 0.970.05 | 1.000.00 | 0.930.09 |
| Random forest(100) | 16 | 0.970.05 | 0.970.05 | 1.000.00 | 0.930.09 |
| Naïve bayse | 11 | 0.960.05 | 0.960.05 | 0.940.08 | 0.970.05 |
| Linear SVM | 7 | 0.960.03 | 0.960.03 | 0.970.05 | 0.940.07 |
| Rbf SVM | 9 | 0.990.03 | 0.990.03 | 0.990.01 | 0.970.07 |

**Data3: DLBCL**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Regularize** | **Classifier** | **Feature Num.** | **AUC** | **ACC** | **Sen.** | **Spe.** |
| Elastic net (alpha=0.5) | None | 54 | 0.930.05 | 0.890.07 | 0.980.06 | 0.880.08 |
| KNN(k=5) | 9 | 0.970.02 | 0.940.04 | 1.000.00 | 0.930.04 |
| Random forest(100) | 7 | 0.970.04 | 0.960.05 | 0.980.07 | 0.950.05 |
| Naïve bayse | 9 | 0.980.02 | 0.960.02 | 0.990.03 | 0.950.02 |
| Linear SVM | 10 | 0.970.02 | 0..950.04 | 1.000.00 | 0.940.04 |
| Rbf SVM | 9 | 0.990.01 | 0.970.02 | 1.000.00 | 0.970.02 |
| MCP | None | 4 | 0.850.09 | 0.810.07 | 0.910.02 | 0.800.08 |
| KNN(k=5) | 6 | 0.970.01 | 0.940.03 | 1.000.00 | 0.940.03 |
| Random forest(100) | 10 | 0.970.03 | 0.950.05 | 0.990.04 | 0.950.05 |
| Naïve bayse | 10 | 0.990.01 | 0.980.02 | 1.000.00 | 0.970.02 |
| Linear SVM | 3 | 0.960.03 | 0.930.04 | 0.990.04 | 0.930.05 |
| Rbf SVM | 4 | 0.980.03 | 0.980.03 | 0.990.06 | 0.980.03 |
| SCAD | None | 13 | 0.900.07 | 0.850.06 | 0.960.01 | 0.840.07 |
| KNN(k=5) | 15 | 0.980.01 | 0.960.02 | 1.000.00 | 0.950.03 |
| Random forest(100) | 7 | 0.970.04 | 0.950.04 | 0.990.06 | 0.950.05 |
| Naïve bayse | 7 | 0.990.02 | 0.980.02 | 0.990.03 | 0.980.03 |
| Linear SVM | 5 | 0.960.02 | 0.930.04 | 1.000.00 | 0.920.05 |
| Rbf SVM | 12 | 0.990.02 | 0.980.02 | 0.990.03 | 0.980.02 |
| Adaptive lasso | None | 12 | 0.770.14 | 0.750.11 | 0.810.24 | 0.750.11 |
| KNN(k=5) | 18 | 0.870.06 | 0.810.05 | 0.950.13 | 0.790.06 |
| Random forest(100) | 17 | 0.910.05 | 0.900.05 | 0.920.12 | 0.900.06 |
| Naïve bayse | 12 | 0.890.09 | 0.800.16 | 0.990.04 | 0.780.18 |
| Linear SVM | 14 | 0.870.07 | 0.840.07 | 0.920.14 | 0.830.08 |
| Rbf SVM | 18 | 0.890.08 | 0.900.07 | 0.870.17 | 0.910.08 |

**Data4: Leukemia**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Regularize** | **Classifier** | **Feature Num.** | **AUC** | **ACC** | **Sen.** | **Spe.** |
| Elastic net (alpha=0.5) | None | 64 | 0.960.04 | 0.960.02 | 0.960.02 | 0.960.03 |
| KNN(k=5) | 16 | 0.980.04 | 0.990.01 | 0.960.08 | 1.000.00 |
| Random forest(100) | 10 | 0.980.04 | 0.980.02 | 0.970.07 | 0.980.02 |
| Naïve bayse | 17 | 1.000.00 | 1.000.00 | 1.000.00 | 1.000.00 |
| Linear SVM | 19 | 0.980.04 | 0.990.02 | 0.960.08 | 1.000.00 |
| Rbf SVM | 9 | 0.990.02 | 0.990.01 | 0.990.04 | 1.000.00 |
| MCP | None | 4 | 0.900.07 | 0.900.08 | 0.900.13 | 0.900.08 |
| KNN(k=5) | 7 | 0.990.00 | 0.980.02 | 1.000.00 | 0.980.02 |
| Random forest(100) | 12 | 0.980.04 | 0.990.02 | 0.970.07 | 0.980.02 |
| Naïve bayse | 6 | 1.000.00 | 1.000.00 | 1.000.00 | 1.000.00 |
| Linear SVM | 4 | 0.980.02 | 0.970.02 | 1.000.00 | 0.960.02 |
| Rbf SVM | 7 | 0.990.00 | 0.990.02 | 1.000.00 | 0.980.02 |
| SCAD | None | 16 | 0.930.07 | 0.930.05 | 0.950.04 | 0.0930.05 |
| KNN(k=5) | 7 | 0.990.00 | 0.990.01 | 1.000.00 | 0.980.02 |
| Random forest(100) | 13 | 0.990.03 | 0.990.02 | 0.980.06 | 0.990.02 |
| Naïve bayse | 8 | 0.980.03 | 0.970.03 | 0.990.04 | 0.970.04 |
| Linear SVM | 8 | 0.990.00 | 0.980.02 | 1.000.00 | 0.970.02 |
| Rbf SVM | 12 | 0.990.00 | 0.980.12 | 1.000.00 | 0.980.02 |
| Adaptive lasso | None | 14 | 0.890.09 | 0.880.08 | 0.900.14 | 0.900.09 |
| KNN(k=5) | 12 | 0.990.02 | 0.980.02 | 1.000.00 | 0.980.02 |
| Random forest(100) | 5 | 0.960.05 | 0.970.03 | 0.960.10 | 0.970.03 |
| Naïve bayse | 6 | 0.970.02 | 0.950.03 | 1.000.00 | 0.940.03 |
| Linear SVM | 11 | 0.970.03 | 0.950.03 | 0.990.05 | 0.940.04 |
| Rbf SVM | 16 | 1.000.00 | 1.000.00 | 1.000.00 | 1.000.00 |

**Data5: Prostata**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Regularize** | **Classifier** | **Feature Num.** | **AUC** | **ACC** | **Sen.** | **Spe.** |
| Elastic net (alpha=0.5) | None | 49 | 0.940.05 | 0.940.05 | 0.930.07 | 0.960.07 |
| KNN(k=5) | 15 | 0.970.03 | 0.970.04 | 0.960.06 | 0.970.05 |
| Random forest(100) | 11 | 0.960.04 | 0.960.04 | 0.940.05 | 0.980.04 |
| Naïve bayse | 11 | 0.960.04 | 0.950.05 | 0.920.07 | 0.980.04 |
| Linear SVM | 10 | 0.950.03 | 0.940.04 | 0.890.07 | 1.000.00 |
| Rbf SVM | 11 | 0.970.03 | 0.970.03 | 0.950.06 | 0.990.01 |
| MCP | None | 7 | 0.910.07 | 0.910.07 | 0.870.12 | 0.950.06 |
| KNN(k=5) | 10 | 0.980.02 | 0.980.03 | 0.980.02 | 0.970.04 |
| Random forest(100) | 11 | 0.960.04 | 0.960.04 | 0.950.07 | 0.960.05 |
| Naïve bayse | 9 | 0.980.02 | 0.980.03 | 0.960.06 | 1.000.00 |
| Linear SVM | 10 | 0.990.03 | 0.990.03 | 0.990.03 | 0.990.04 |
| Rbf SVM | 9 | 0.970.04 | 0.970.04 | 0.940.08 | 1.000.00 |
| SCAD | None | 22 | 0.930.05 | 0.930.05 | 0.900.09 | 0.960.06 |
| KNN(k=5) | 9 | 0.990.01 | 0.990.01 | 0.990.02 | 0.990.01 |
| Random forest(100) | 15 | 0.960.04 | 0.950.04 | 0.930.07 | 0.980.04 |
| Naïve bayse | 11 | 0.970.03 | 0.960.03 | 0.930.07 | 1.000.00 |
| Linear SVM | 9 | 0.990.02 | 0.990.01 | 0.970.05 | 1.000.00 |
| Rbf SVM | 9 | 0.980.02 | 0.980.02 | 0.930.05 | 0.990.03 |
| Adaptive lasso | None | 15 | 0.900.06 | 0.910.07 | 0.920.07 | 0.900.09 |
| KNN(k=5) | 16 | 0.970.03 | 0.970.03 | 0.980.02 | 0.960.05 |
| Random forest(100) | 10 | 0.950.5 | 0.950.05 | 0.930.08 | 0.970.04 |
| Naïve bayse | 7 | 0.970.04 | 0.970.04 | 0.940.06 | 0.990.03 |
| Linear SVM | 14 | 0.990.02 | 0.990.02 | 0.980.03 | 0.980.04 |
| Rbf SVM | 9 | 0.980.03 | 0.980.03 | 0.960.05 | 0.990.02 |